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THE GEOGRAPHICAL JOURNAL

Vol. LXVII No. 2 February 1926

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The Geographical Journal

Vol. LXVII No. 2 February 1926

EXPLORATIONS IN SOUTH-EASTERN TIBET

F. Kingdon Ward

Read at the Meeting of the Society, 25 May 1925. Map follows p. 192.

I. OVER THE TSANGPO–SALWEEN DIVIDE

IN 1923, through the kindness of the Indian and Tibetan governments, I obtained permission for myself and one other white man to botanize in Eastern Tibet. The Government Grant Committee of the Royal Society and the Committee of the Percy Sladen Memorial Fund gave me grants which permitted me to carry out my plans; Earl Cawdor, who had already had experience of travel in the Arctic and elsewhere, volunteered to accompany me, and we sailed from England on 2 February 1924. Darjeeling was reached on March 10, and here General Bruce, who was organizing the Mount Everest Expedition, assisted us in making arrangements for mules and ponies, which were to take us to Phari, just over the Tibetan frontier, and in the selection of a permanent staff of three servants, who spoke both Hindustani and Tibetan. We left Darjeeling on March 14, and proceeding *viâ* Kalimpong, arrived at Gangtok on the 18th, where we were the guests of Major and Mrs. Bailey for two days.

It will be recalled that in 1913 Majors Bailey and Morshead had made their great pioneer journey from Assam *viâ* the Mishmi Hills to the head of the Tsangpo gorge, which they had then penetrated for nearly three-quarters of its length; after which they had returned up the Tsangpo as far as Tsetang, exploring the unknown regions to the south. Practically nothing was known of the flora of this region, but Major Bailey had brought back a few fragmentary dried plants, a number of seeds, and some valuable hints, sufficient to whet the appetite of a botanist. He was now able to give us further information, useful advice, and our Lhasa passport; armed with which, we started for Tibet. We reached Gyantse on April 2 without incident, Mr. MacDonald, the British Trade Agent, having sent a man down to Chumbi to meet us, and make arrangements about transport.

We spent a lively week at Gyantse waiting for our stores, which were being forwarded from Calcutta, and very pleasant it was. Besides the Trade Agent, there were stationed in Gyantse at this time the Com-

mandant of the guard (Captain J. E. Cobbett), the medical officer (Major J. H. Hislop), and the schoolmaster in charge of the new Tibetan School (Mr. F. Ludlow). Our stores having arrived, we took to the road again on April 11, in very cold weather, travelling towards Lhasa; but after crossing the Karo La and descending to the south-west corner of the Yamdrok Tso, we left the Lhasa road and travelled due west along the southern shores of the lake.

In the previous year Major Bailey and Captain Meade had travelled through this region, but the excellent map which the latter had made was not then available. Bailey's story of this journey, with Meade's map, was published in the *Geographical Journal* of October 1924. Not till we reached the south-east corner of the lake were we on unknown ground.

We slept the night of April 17 at a small village called Chogpotung, where a stream enters the lake from the east. From this point to Tsetang we were on unexplored ground. There were hundreds of hares on the stony hills here, as well as duck on the lake. On the 18th we marched due east up a broad grassy valley, and presently reached a small village, where we halted to change transport. Continuing more or less eastwards over wide pastures, we passed a fine fort called Ache Dzong, and entered on a bleak plateau country, where we saw cranes, duck, and geese by the river, and innumerable pica hares, and later a fox. At dusk we reached the stone village of Tragtse, after eight hours' marching.

We had to cross a high pass next day, so we started early. Unfortunately, the view was spoilt by a heavy snowstorm. Actually we crossed two passes, the Dzara La and the Shamda La, after which we descended rapidly, and getting out of the snow, saw below us a valley with trees and houses and green grass—a regular Garden of Eden after three weeks on the plateau. A vast crowd of curious sightseers welcomed us at the monastery of Chonggyechenyag. There were some fine old poplar trees here, one of which was 30 feet in girth at a height of 3 feet from the ground.

On the 20th we marched down the valley, through a certain amount of cultivation and past a number of small villages and scattered houses. There were clumps of trees, mostly willow and poplar, protected by walls, and peach trees in bloom; and along the stream thickets of Hippophæ. Many of the larger trees were pollarded. We saw no sign of crops, but people were ploughing in the fields.

As we got lower down, the valley grew more and more stony, trees and cultivation almost disappeared, and presently the stream did likewise. Ahead of us we saw a great rocky ridge, crowned by an ancient fort, with a newer fort lower down, the two connected by a double wall, leaving a passage between. (It appeared that the upper fort had been abandoned on account of the difficulty of getting water.) At the foot of the ridge was a monastery.

The monastery was called Riudechen, and the fort Chongche; the latter was a fine building in a commanding position, and peculiar for a semicircular bastion at one end and a wooden gallery above, like the poop of a Spanish galleon. There was a stone pillar in the valley below, with an inscription in Chinese, which looked fairly modern.

Continuing down the dry stony valley next day we reached the small monastery of Chongmoche, where there were many large and small chörten, like a cluster of Burmese pagodas. Below this the valley became fertile and thickly populated once more, and the trees were in leaf. Late in the afternoon we reached Netong Dzong, and called on the magistrate; and then rounding the shoulder of the hill, we saw Tsetang, below us, with the Tsangpo beyond.

We spent April 22 in Tsetang and made friends with Ata Ulla Khan, the Ladaki trader who had assisted Bailey and Morshead in 1913. It snowed the next night, but the snow was melting fast when we left Tsetang, following the right bank of the river to Rongchakar, where there is another fine fort. We ought really to have left the river here and turned south-west into the mountains to Lhagyari Dzong, which appears to be the normal route for any one travelling down the valley—if there can be said to be any normal route. This was Bailey's and Morshead's route. But we wanted, if possible, to follow the river through the gorge below Trap, so we continued along the river-bank next day as far as Trap, only to find that there was no way of getting through the gorge. However our journey was not fruitless, for we discovered that it was possible to make a *détour* to the north instead of to the south, and cover some new ground that way. We therefore crossed the Tsangpo in coracles and camped in a valley on the other side, reaching Öga Dzong on the following day. There is a road northwards from Öga Dzong which joins the Lhasa road on the other side of the range; of this more anon. We ourselves turned eastwards again up a broad grassy valley, and soon reached the last village, Pechen, where we halted.

On April 27 we arose at 4.30 to face a long march. The morning was brilliantly fine, but after midday the sky clouded over and snow fell heavily. The pass was not reached till 4 o'clock, and deep soft snow made the going rather bad for the transport. At the head of the valley is the last remnant of a rapidly disappearing glacier.

The Lung La, as the pass is called, is over 16,000 feet, and rather steep on both sides. An hour after dark we reached the monastery of Chögorche, where we put up for the night.

On April 28 we continued down the valley to the wretched village of Tsegyu, where we had difficulty in getting our transport changed. Consequently we did not get away with all hands till 4 o'clock in the afternoon, and another night march ensued, Gyatsa Dzong not being reached till 10 p.m. At Gyatsa we found ourselves by the Tsangpo

once more, having "turned" the gorge below Trap. The maps show Chögorche and Tsegyu on different streams, but this is incorrect.

An interesting geographical point now arises. If one travels from the plains of India to the Tsangpo anywhere west of the 93rd meridian, say, two distinct ranges of mountains are crossed, with a stretch of the plateau supported between them. The first is the Great Himalayan range; the second is the so-called Ladak, or Trans-Himalayan range. We crossed the latter by the Karo La on the outward journey, and by the Yarto Tra La on our return. But crossing the mountains by the Doshong La, or the Nam La, or by any pass east of the 94th meridian, only *one* main range is crossed between the Tsangpo and the plains—the Great Himalayan range. What then has become of the other? We can hardly suppose that it has disappeared, nor is it likely that it has been absorbed into the Himalayan range. The only other possible explanation however is that it is now *north* of the Tsangpo—in other words, that that river has cut across its axis.

There is some little evidence in support of this last view. In the first place the river below Trap flows for 30 or 40 miles in an impassable gorge, descending several hundred feet. To avoid this gorge, Bailey and Morshead crossed a pass over 16,000 feet high to the south, while we crossed one of about the same height to the north. Finally, and more directly, from Öga Dzong, in the winter, we saw a group of snow-clad peaks on the left bank of the river, trending in an east-north-east direction and continuous with a snowy range on the right bank, east of Tsetang. What becomes of this range we do not know, but it may form the watershed between the Lhasa and Gyamda rivers.

For the next three days we followed the left bank of the river, crossing to the right bank at Nang Dzong on May 1. The Tsangpo here twists and turns round craggy spurs in bewildering fashion, flowing however smoothly. Barren stony terraces and large sand-dunes thinly clad with thorn scrub (*Sophora viciifolia*) prove how arid and wind-swept the valley still is. The weather continued cold and inclement, with brief bursts of sunshine followed by showers of sleet, and fresh snow on the hills.

In the villages, however, which were becoming more numerous, there was a change, and we noticed apple, peach, pomegranate, walnut, poplar, and willow trees, besides fields of broad beans. We also saw a variety of birds, including babblers, rose finches, jackdaws, hopoes, choughs, larks, and sparrows; on the rocks were big ugly grey lizards.

In the gorge below Nang Dzong—round which we had to make a second *détour*—we saw scattered juniper trees, which henceforward became common, till replaced by pine trees a few days later.

After crossing a wooded limestone ridge by an easy pass we again descended to the river, and marched over high sand-dunes in a boisterous wind, which raised a rasping sand-blast. In the afternoon we reached a village called Lishö, on a small tributary about a mile from the Tsangpo.

THE TRASUM TSO AND TSOSONG MONASTERY

Sanglung. Namcha Barwa.

THE ASSAM HIMALAYA FROM THE KARMA LA: THE TSANGPO GORGE BEYOND SECOND RIDGE

THE TSANGPO GORGE THROUGH OLD MORAINES OF NAMCHA BARWA, BETWEEN PE AND GYALA

RETREATING GLACIERS OF THE TSANGPO-SALWEEN DIVIDE, NORTH OF THE TRASUM KYE LA

There is a road up this valley which crosses the mountains to Tsari, but there was said to be too much snow on it for any one to be able to cross until June.

We continued along the right bank of the river for several days, while the vegetation grew gradually more varied, and the forest crept down lower and lower, denoting approach to a wetter climate. The type of house also changed from the flat-roofed house of the plateau to the pent-house roof of Kongbo; while dug-out canoes showed that there were big trees not very far away. This fact was strikingly brought home to us in one village, where we saw a flag pole 200 feet high!

We came across several Abor slaves hereabouts. We were told that about twenty years ago there had been trouble amongst them on the other side of the Himalayan range, and some of them fled into Tibet to escape unpleasantness, and took service with the Tibetans.

On May 1 we reached Lilung, where a big stream comes in from the south. There is a path up this valley which leads to New Tsari, but it is said to be used only by pilgrims, since New Tsari boasts no population. There was formerly a fine bridge over the tributary stream here, but it had been destroyed by a flood, and we had to march a mile up the valley to another bridge. Villages were now becoming more numerous, and we had to change transport frequently, often three or four times a day, which caused considerable delay.

On May 11 we crossed the river in dugouts and reached Tsela Dzong, at the junction of the Gyamda river. We were given a small house in which to live, as we proposed to settle down here for some days and explore the neighbourhood for plants; but we eventually decided that movement in the angle between two big rivers was too restricted for our purpose, and after spending three weeks at Tsela, we shifted our headquarters 30 miles eastwards, to the village of Tumbatse, by the Rong Chu. During our stay at Tsela we made a botanical reconnaissance of the neighbourhood on both banks of the Tsangpo, and on both banks of the Nyang Chu or Gyamda river, which here flows in four big streams in a valley a mile wide. At this time there were more fields and sandbanks than waterways at the junction, but in the rainy season most of the land is submerged. Fierce winds blew every day, and a perpetual cloud of fine sand hung over the Tsangpo. Nevertheless, on the few really clear days we enjoyed here, we found that the magnificent snow spire of Namcha Barwa, nearly 50 miles distant, was clearly visible from our window.

There are two peaks rather over 14,000 feet in altitude, one on either side of the junction. The peak above Tsela Dzong is called Pab Ri, and is of no particular consequence; but that on the left bank of the Gyamda river, called Kongbo Peri, attracts pilgrims from far away, who march round it. We could see no particular merit in it as the central sun of a solar system; but on climbing to the summit we were

rewarded with one of the most extensive and magnificent mountain views imaginable. To west, north-west, and north, and growing dim in the north-east, stretched a huge range of snow mountains. Namcha Barwa and Gyala Peri in the east were easily recognized; beyond that we felt convinced we were looking at the Tsangpo–Salween divide. Unfortunately, the nearest peaks were at least 50 miles distant. The Himalayan range and this range to the north converge towards the north-east, though whether they eventually become one we could not ascertain.

This Salween divide, which is considerably nearer the Tsangpo than the maps indicate, proved a stumblingblock. We had hoped to visit the Salween, but we spent so long in August looking for a way over this barrier while we marched westwards along its base, that we had no time left to make the journey. Between the 93rd and 95th meridians, one river—the Yigrong—cuts through the range, and two passes—the Trasum Kye La and the Tro La—cross it.

On June 4 we left Tsela Dzong, and crossing the Gyamda river reached Temo Gompa in the afternoon. From here we proceeded over the Temo La, where we camped for a week in order to botanize. Descending to the Rong Chu we took up our residence in Tumbatse. Our first important excursion was over the Nyima La and down to the Tsangpo, which we crossed by canoe below Pe; then up the Doshong Chu (which joins the Tsangpo below Pe) to a camp below the pass. Even as late as June 29 there was very deep soft snow on the Doshong La, which however we crossed, descending 2000 feet on the Pemako side; we could not move our camp over, though this we managed to do towards the end of October under conditions almost as bad. Both sides of the pass show clear evidence of glaciation, and it seems probable that on the north side the glacier must have reached the Tsangpo, which at that date would of course have flowed at a higher level. There is a snow peak immediately south of the pass on the Pe side, though it is not very high.

A tremendous quantity of snow falls on the Doshong La, and much of it rarely, if ever, melts. For eight months in the year it is impossible to cross over, though the height is only 13,500 feet, according to Majors Gunter and Pemberton, who crossed the pass in 1913 from river to river, when surveying with the Abor Exploration party. We ourselves camped at the foot of one big avalanche, and we saw the results of a second one on the other side, which had not all melted when snow was beginning to fall again in October.

The pass is therefore very low compared with the height of Namcha Barwa (25,445 feet), which is only 10 miles distant; but I have frequently observed that the lowest passes are commonly found in the neighbourhood of the highest peaks, at least in Western China and the Himalaya. The explanation of this apparent paradox is quite simple; for these low passes are at the heads of old glaciated valleys, whereas

higher passes in the neighbourhood of lower peaks are either water-worn or owe their origin to much smaller glaciers.

There was an extremely rich and varied flora at the Doshong La, and it was surprising to find that the Alpine flora at this extreme end of the Himalaya was more closely related to that of Western China than to that of the Sikkim Himalaya.

Our second journey from Tumbatse was over the Tang La, a low pass immediately to the north of the Nyima La, and down to the Tsangpo again by an excruciating path. The river was now in flood, and booming into the gorge at high pressure, so we were unable to cross here, but had to march down the left bank and cross by the rope bridge at Gyala, a species of slow torture which we did not appreciate. From Gyala we marched up the right bank a long day's march to a village called Tripe, and on the following day started up the steep path which leads to the Nam La, the most easterly pass across the main Himalayan range proper. After reaching a cultivated terrace about 1200 feet above the river, the path virtually ceased, as few people ever travel this way except to the pastures on this side, and a recent epidemic amongst the yak had so reduced the herds that the pastures were temporarily out of commission. We had to make our own way up the steep flank towards the peak of Namcha Barwa, and finally we camped in a meadow.

Next day we continued the ascent over very rough ground—a series of tree-clad moraines, and climbing steeply through dense Rhododendron scrub, we finally emerged into the Alpine region and camped just above a fine lake—the Nam La Tso—at the head of the valley. Opposite us on the other side of the lake was a snow peak called Temu Tse, and there were other peaks with small glaciers attached near the pass, which was hidden behind a tremendous cliff. A notch in the ridge which ran down from Temu Tse gave entrance for the nimble yak to the Doshong La valley.

The most interesting features here were (i) the enormous amount of deglaciation which had taken place and was still continuing; and (ii) the surprising difference between the flora of this valley and that of the Doshong La valley, a bare 6 miles away. The reason for this seems to be entirely climatic.

On July 24, the day after our arrival at the upper camp, we essayed the ascent of the Nam La, which had not previously been visited by Europeans. There is no way up the valley head, which, above the lake, is choked with moraines and glaciers; and the pass lying some distance back, it is necessary to ascend the cliffs and traverse by a difficult path. We had not brought any animals with us, and in any case they could not have reached the pass, though yak come up as far as the lake.

After much climbing up and down the cliffs, and some bad going over the moraines, we reached a glacier, crossed this, and presently found ourselves at the foot of a very steep snow slope leading to the pass, from

which proceeded a glacier. By this time the day was getting on. One of our guides had already fallen in the rear, and we were chary of taking the other to the top, as he had never been before, and we knew nothing about the glacier conditions or the danger of avalanches. So we pushed on alone, Cawdor leading, and, keeping close under the cliff so as to avoid as far as possible the snow-clad glacier, soon found ourselves floundering knee-deep in the soft snow. It took us nearly an hour to reach the summit, though on our return we skated down through the soft snow in fifteen minutes. In November we camped at the same spot for several days, and on the 6th Cawdor succeeded in reaching the summit again, where he obtained a boiling-point observation which gave the altitude as 7587 feet above the river-level at Pe, or 17,129 feet absolute according to our records (rather more according to Morshead's value for Pe).

We had hoped to cross this pass into Pemako and reach a monastery called Mandalting, below which is a Lopa (Abor) village called Puparang, probably on or near the Tsangpo; but in view of Cawdor's report and the unsettled weather, we decided that it would have been too risky an undertaking. It was as well we abandoned the project, as it turned out, since we should certainly never have been able to recross the pass.

The Nam La is used only by a few Lopas, and then not regularly. A party of three had crossed in the summer, but the pass is open barely three months in the year, so that nearly all communication with Pemako is carried on over the much lower, though not much easier, Doshong La. But the latter is at any rate safe, whereas natives are known to have been lost and frozen to death trying to find their way over the Nam La.

Returning to the Tsangpo, we made our way back to Gyala, and while the kit was being slung across—an occupation which took practically the whole day—we tried to make our way down the river by a path we had discovered on our previous visit. On that occasion we had pushed on about 2 miles, sometimes waist-deep in the river, but darkness had compelled us to give it up.

In the course of ten days the river had fallen no less than 12 feet by a measured mark, and we were now able to get along without wading till we reached a big torrent with an enormous rapid in the river. Our Tibetan companions discreetly refused to cross this, so Cawdor and I struggled across holding hands, to their unbounded delight. However, immediately afterwards we came up against a huge cliff, which there was no possibility of getting round; so we returned to Gyala, after taking our first boiling-point observation in the gorge. On the following day we started straight up the mountain for the Tra La, following the torrent which falls over the cliff called Shingche Chögye, opposite Gyala, as described by Bailey. We suspected this of being a glacier stream, and so it proved. It was not till the third day that we reached the pass, which is considerably higher than the Nyima La, having crossed the stream and observed that it came from a group of glaciers, one of them of

fair size, south of Sengdam Pu. The pass is a difficult one on both sides, the approaches being very steep, and only yak perhaps could cross, and not even they if heavily laden.

Returning once more to Tumbatse, we started again on August 9, and followed the Rong Chu northwards to its junction with the Tongkyuk river, and crossing the latter reached Tongkyuk Dzong. We made an excursion to the actual junction of these streams, and ascertained that the Tongkyuk stream is considerably the bigger of the two, as was to be expected of a stream having its origin amongst the snow peaks of the Salween divide. A boiling-point observation gave the altitude at the junction as 8297 feet. Bailey and Morshead had reached Tongkyuk from Showa, but the country to the west of Tongkyuk was entirely unknown.

On August 12 we started up the valley of the Tongkyuk river, and presently came to the village of Temo, outside which stand two large wooden figures, 9 feet high, forming a sort of gateway. We saw the same thing at the next village, Paka, but nowhere else. I have never seen such a thing before in Tibet; but it must be remembered that we were now in Pome, where they do things rather differently; for instance, in one village we saw signs of phallic worship.

After crossing the stream twice by good cantilever bridges, we camped in a meadow. On the following day we marched about 16 miles to Nambu Gompa, a small three-storied stone building in the upper ice-worn valley. The snow peaks of the Salween divide were quite close to us, a little to the north, but we could see nothing on account of the clouds, though we had a glimpse of them in the winter.

On the 15th we crossed the Nambu La, a comparatively easy pass with a lake on each side and a group of snow peaks to the south; we camped in a meadow on the far side, and then descended to a big valley with a small glacier lake at its head (above which, and almost reaching the water's edge, was a glacier). Down this valley we marched to the village of Lopa. Continuing down the same valley for a few miles we reached the beautiful Pasum (or Trasum) * lake next day, and halted at the village of Je. This lake, which is about 8 miles long and 2 miles wide, in a closed valley 12,003 feet above sea-level (by boiling-point), is sacred, and it is considered a meritorious act to walk round it. Near the head of the lake are a number of fine snow peaks—the Salween divide again—the most conspicuous being the pyramid of Nam La Karpo, visible from Je.

A big stream flows in at the head of the lake, but the road shown on the maps as crossing the range above the lake (which in any case is about

* In the Lhasa dialect Tra, but in country speech it is nearly always pronounced Pa. Thus it is generally called Pasum Tso, though actually spelt Trasum. Similarly with the Tra La usually called Pa La; it is not Tara La, as on Sheet 82 K, Survey of India.

30 miles out of position) is fictitious, as we found to our cost; we had to travel yet farther west before we could get over this formidable barrier.

We now proceeded to circumambulate the lake, and reached a village called Tsogo (" lake head "), where we were held up for want of transport. Proceeding along the west shore, we saw a small island with a monastery close in to the opposite shore, and eventually reached a village at the foot of the lake. A large terminal moraine blocks the valley here, and holds up the lake, which occupies the site of a large glacier; but the stream has cut through the moraine, and flows into a broad, fairly thickly populated valley to Shoga Dzong, where another considerable stream comes in from the west; the united streams flow into the Gyamda river about 6 miles below Shoga Dzong, which was reached on August 20.

The Shoga Dzongpen had a small son at the Gyantse school, and was greatly pleased at our being able to give news of him. We now turned northwards, or rather north-westwards, for the first time since leaving Tongkyuk, and felt that we were getting on a little; for our ambition was to reach the Salween. Following up the other branch of the stream a few hours' march brought us to another confluence, where stood the important monastery of Drukla. The Commissioner from Gyamda was here inquiring into certain irregularities of living, the upshot of which was that sixty monks were ignominiously expelled into a cold hard world, and told to go and join the army in Lhasa.

The valley above Drukla was again fairly well populated, and we passed through a number of small villages, the last of which was called Pungkar. We were now well into the great snowy range, and continually saw snow peaks on either side of the valley.

We camped once above Pungkar, and a path which led to the Yigrong river was pointed out to us. We continued towards the source of our stream, however, and at last on August 25 we crossed the Salween divide by a high pass called the Pasum (Trasum) Kye La, 17,230 feet.

From the summit we counted six snub-nosed glaciers at the head of the valley into which we were about to descend, though not one actually reached the valley now. There were snow peaks and glaciers all round us, in fact, but they were withdrawing in force. High as this pass was, however, we were able to take ponies over it, and there was no snow; it gave much less trouble than the Doshong La, for example. The forest, which had been rapidly dwindling, now disappeared entirely, and we descended into a very bleak and desolate valley, where there was not a stick of firewood. We were back on the plateau, and had to put up with plateau conditions.

After camping with some yak-herds we descended gradually, and presently joined the Lhasa road at the small Atsa Tso. In the afternoon we reached Atsa Gompa, the most depressing place we had yet seen. However we managed to spend three more or less profitable days here, with no ill effects. Here of course we were on well-known ground

several explorers, including the late Brigadier-General Pereira, having passed through Atsa. We spent one day on a trip to the Banda La, which had been crossed nearly two years previously by General Pereira on his journey to Lhasa. We made the altitude 18,110 feet by hypsometer, and it certainly seemed it. From here we had a splendid view to the north, where we saw several very lofty snow peaks, beyond which, we were told, lay the Salween; so we gave up all idea of going there. South of us, just across the valley from Atsa, was another snowy range—part of the Tsangpo divide. To the east was a fine snow peak called Chakyajō, in Pome.

The stream from the Atsa Tso flows eastwards and is joined by the stream from Lharugo; the combined stream, which actually starts north of the Tsangpo divide, then cuts through that range and flows south as the Yigrong; the Atsa Tso—or rather the stream from the Tro La which feeds it—is thus really the source of the Yigrong. (Maps show the water from the Atsa Tso flowing to the Trasum Tso, which is incorrect.)

It may be remarked here that the Yigrong is the only river west of the Po Tsangpo which does cut through the range. Neither the Gyamda river nor any of its tributaries do this, all rising from its southern face, which is perhaps the reason why there are so few passes over it.

Retracing our steps to the Atsa Tso we turned up another valley, now following the Lhasa road, and camped at a post below the Tro La, which we crossed on August 31, at 17,650 feet.

No sooner had we crossed the divide again than we came into more fertile country, bushes and shrubs appearing lower down. That night we reached a single house called Tramdo, and on the following day the small village Laru, passing a monastery called Ko, conspicuously perched on a rock at the junction of two valleys. On September 2 we covered the remaining 12 miles to Gyamda, a considerable village in the angle between two rivers. The fine cantilever bridge which formerly spanned the northern stream had been destroyed by a flood, and we crossed in skin boats. By January the river was frozen nearly solid, and a foot bridge was thrown across, but work had not yet been started on the big bridge. Gyamda is dirty and not very interesting; but it boasts a post office, and a shop kept by a Nepali, where one can buy candles, cigarettes, fur caps, and a few other things. Formerly there had been a regular colony of Chinese shops, but these were all destroyed when the Chinese were expelled from Tibet. The road to Lhasa turns north here, but we left the known country behind us, and continued our exploration.

We now turned eastwards down the wide and well-populated Gyamda valley, reaching Napö Dzong the first day, where we were royally entertained to a wonderful Chinese meal. The road follows the left bank of the river for two days' march, then crosses to the right bank by an ex-

cellent bridge, and keeps to that side till Tsela Dzong is reached. On September 5 we slept at Kangra, having crossed the river. Opposite us on the left bank was the little monastery of Namse, where the Shoga Dzong river joins in; from Namse to Shoga Dzong is a short day's march. There are frequent groups of mud watch-towers scattered over all these valleys; they look rather like factory chimneys, and are said to date back several hundred years.

On September 7 we reached Nyalu, where for the first time since leaving Tumbatse a fine night enabled us to take an observation for latitude; we took another on the following night at Chomo Dzong. Below Chomo Dzong the valley widens out and is quite thickly populated. We reached Puchu that night, and Tsela Dzong on the 10th, having taken eight days to do the 90 odd miles from Gyamda. The river was beginning to fall now, and after stopping a day to collect certain seeds, we set out for Tumbatse *viâ* the Temo La, arriving there on September 15.

II. THROUGH THE GORGE OF THE TSANGPO

The rest of September and the first week of October were spent seed-collecting north of the Tsangpo. The weather was still very unsettled; rain fell most days, and the snow peaks were seldom clear. From October 1 till the 7th we were on the Temo La again, but only on one occasion did we get a clear view of Namcha Barwa from a camp half a mile north of the pass. At the same time we saw the tip of a sabre-tooth snow peak in the gap between Gyala Peri and Namcha Barwa far down the gorge. This could not have been Sanglung, which is hidden behind Namcha Barwa; the natives called it Trilatsengen, but that name might have been made up on the spot!

There is a high rocky peak on the divide a few miles north of the Temo La and almost opposite Tumbatse, called (so it is said) Tagkyejopo, though we called it simply the Hump. The least worthy and most obscure places always seem to have the longest native names, which makes one suspect that they are produced at short notice to satisfy the curiosity of the stranger. On October 5 I climbed this peak (16,182 feet), and having got one round of angles before dark, sat up there the night hoping to get another round at dawn. However clouds and snow ruined the view, and I saw nothing; but it may be remarked that a good view of the Salween divide to the north is obtained from here, as well as of Gyala Peri, Namcha Barwa, and the Himalaya to the south. On the other hand, it will be as well to warn future travellers that it is extremely difficult to get a good resection from anywhere near the Temo La, using only the obvious and outstanding fixed peaks to the east, as these are on the arc of a circle whose centre is near the pass. The "Hump" to the west of Tumbatse, and the "Plug" opposite it immediately to the east of Tumbatse (and visible from it), are obvious points to fix, being the

THE NAM LA IN NOVEMBER

CHONGCHE DZONG ABOVE TSETANG

NAMCHA BARWA, FROM A TERRACE ABOVE THE TSANGPO AT KYIKAR

loftiest in the neighbourhood. On October 11 we left Tumbatse, crossed the Nyima La, and descended to the Tsangpo, proceeding thence to Pe.

The Mönbas were now crossing the Doshong La in hundreds, a few Kampas, Pobas, and Kongbas with them; we also saw three Lopas—presumably the people we call Abors—who had come 25 marches. They had all come to get salt, bringing rice, curry, vegetable dyes, canes (used for whip stocks in Tibet), maize, tobacco, and a few manufactured articles such as coloured bamboo baskets, garters, and so forth.

There were two officials at Pe to deal with the traffic: a representative of the Tsela Dzongpen, who took half the produce, and a representative of the Pome Raja, who took the other half, and also collected taxes. Each house pays 14 seer of rice, or some equivalent.

The travellers were ill clad for such a journey, especially the dwarfish Lopas, who had hardly any clothing; and though it does not take long to cross the Doshong La, which is the only pass, they carried loads of 80 lbs. through deep snow. By the end of October traffic ceased, the pass being then practically snowed up; but at this time not a day passed without fifty or a hundred people coming over—men, women, and children—and Pe, with its camps, and supplies, and people coming and going, presented a lively scene. Between one and two thousand must have crossed the Doshong La in October, which made Pemako appear quite thickly populated. But it is not. The area of Pemako cannot be less than 20,000 square miles, and probably a third of the population come to Pe for salt each year. Most of the remainder go to Showa.

Some of the travellers carried bows and arrows; both bow and bowstring were made of bamboo, and the bamboo arrows were iron-tipped and poisoned with aconite. Also one end of the bow was iron-shod, so that it could be used as a walking-stick. Cawdor also noticed that bowmen wore on the left wrist a bamboo bracelet, about 2 inches wide.

We spent a fortnight in camp at the Doshong La, experiencing heavy snowstorms on the pass, and particularly on the Pemako side, almost every day. We crossed the pass on the 21st, camping about 2500 feet down on the Pemako side. From here we made a trip down the valley for about 4 miles, though we were still some distance from the Dihang. At this point the Himalayan range reaches its narrowest, and it is only 25 miles from the Tsangpo flowing north-east at Pe, at an altitude of 9700 feet, to the Dihang flowing south-west at Yortong, at an altitude of 2500 feet. But the watershed is much nearer the Tsangpo than it is to the Dihang, the Doshong La being scarcely 8 miles from Pe.

There is a quaint prophecy said to be recorded in a sacred book by some fabulous person whose image is kept in the monastery at Payi, that Namcha Barwa will one day fall into the gorge and block the Tsangpo, which will then flow over the Doshong La! After seeing the large ice-worn valley on the other side, one wonders whether this is not rather a legend of the past than a prophecy of the future.

On the Pemako side the valley descends in a series of gigantic cliff steps separated by glacial flats. Just below our camp a big glacier torrent comes down from the north, evidently rising from the snow peak of Temu Tse; there appears to be another snow peak forming part of the southern wall of the valley, not far from the pass, on the Pemako side. Below the Alpine region the valley is filled with forest—Rhododendrons of all kinds, and conifers—in which we saw monkeys. The rock is everywhere a white-and-black-banded gneiss; but the banding is always highly contorted, and it is difficult to say whether the gneiss was first formed and then crumpled, or whether the banding is itself due to the crumpling.

On October 28 we reached Pe, and having packed our seeds, marched down the river to Kyikar. On November 1 we started for the Nam La, reaching our old camp at 14,000 feet next day. Things were very different here from what they were at the Doshong La. The stream had ceased to flow, and there was only just sufficient snow near at hand to keep us supplied with water. The weather too was fine and clear; consequently it was much colder, the sheltered thermometer recording 11° of frost on November 4, 28° on the 5th, and 25° on the 6th.

We managed to intersect the Nam La from two points fixed from Namcha Barwa (it is shown about 5 miles too far north on maps), and Cawdor reached the summit as described. Then having collected our seeds we returned to Kyikar, another storm having meanwhile swept over the eastern Himalaya.

On November 12 we started for Gyala, reached on the 13th in brilliant weather; and after some delay we started for Pemakochung on the 16th. Our party consisted, besides ourselves, of twenty-three porters (ten men and thirteen women), a lama from Pemakochung, who some years previously had been through the gorge, and Tom (*sirdar*). Dick (cook) was in support as far as Pemakochung, whence he would return to Gyala and rejoin Sunny Jim (servant). They were then to take all our kit back to Tumbatse, and on to Tongkyuk, where the whole party would reassemble about December 10.

Most of the coolies carried rations. Our personal property comprised only bedding (two coolies), collecting box (one coolie), botanical presses (one coolie), and survey instruments (one coolie). We had also two boxes of stores, consisting chiefly of slabs of chocolate and a liberal ration of first-rate soup from home; our only regret was that we were unable to carry more. There had been a hitch at Gyala, because the Depa, who had been so anxious to help us in the summer, had slept on it for two months, and then come to the conclusion that perhaps we ought not to go! He therefore sent a letter to his superior, asking if it was in order. As luck would have it, our friend the Commissioner of Gyamda was at Temo, fumigating more monasteries, and the letter reached him. He not only replied by telling the Depa that he must supply us with

transport, but also sent us the lama from Pemakochung (and known as the Walrus) to be our guide.

The opposition of the Depa was probably connected with some fear that the way through the gorge might be opened again; the policy of the Kongbo officials being to close it, partly no doubt in order to exclude Poba robbers, who in the past have given a lot of trouble, raiding as far as Temo, and partly owing to the difficulty of controlling taxation and trade by this route. As long as the Pemako merchants keep to the Doshong La, this is a comparatively simple matter.

We had no sooner started than another storm swept up the gorge, and we spent two damp nights in the forest before finding shelter under a huge boulder at the Nyukdsang camping ground of Kinthup and Bailey. Here we got a boiling-point in the river-bed. Immediately below Nyukdsang a glacier reaches the river-bed on the left bank. A semicircle of snow peaks, including Gyala Peri and Sengdam Pu, pour five converging glaciers into a common funnel-shaped valley, which contracts below to a steep and narrow glen through which the ice stream reaches the river. No other glacier does this, though many did so in the past.

On November 20 we reached Pemakochung, placed on a knoll in the midst of swamps in a mountain bay between Namcha Barwa and Sanglung. Here we rested on the 21st, Cawdor to visit Kinthup's fall, I to botanize. Next day we continued the march, crossing the Talung and Sanglung glacier streams, and camping in the river-bed just beyond the latter. There were some cold sulphur springs here under a rock, far below high-water mark, but now exposed. We took another boiling-point. A ridge of gneiss, drilled with large pot holes, runs out into the river at this point, squeezing it up against the opposite cliff, and there is an almost vertical fall of about 10 feet.

For the next few days the going over the cliffs was difficult and progress slow. At one place we were held up for two hours by a 40-foot chimney, while trees were felled and notched to make ladders; at another we had to descend a steeply sloping cliff into the river-bed, and then immediately climb a high earth bank in order to get out again. But after crossing another torrent, the Churung Chu, we found ourselves on a takin trail; and though we had to do a good deal of cutting in order to make a way for the coolies, not so much time was wasted seeking a route. We were travelling between 4 and 5 miles a day now. On the 25th we had to descend an awkward cliff, probably the one which had finally baulked Bailey; and on the 26th we camped by another glacier stream, the Shegar Chu. This day also we met with disaster, the metal triangular support of the plane-table being lost. However, we contrived a wooden substitute to fit into the socket of the theodolite stand and support the plane-table.

After the 25th we were on unexplored ground again. All this time

the river was flowing in a general north-easterly direction, in a series of falls and boisterous rapids, skidding violently from time to time, but in the main keeping direction. Dense forest filled the gorge from water-line to snow-line, and every two or three days we found ourselves down to a new stratum of vegetation.

On the 27th we advanced only about 2 miles, the Shegar Chu proving a more formidable obstacle than it looked. I tried to reach the glacier foot by following up the stream, which had cut the abandoned moraines into terraces, but was unable to do so. On the 28th we were again delayed by a high cliff, which the porters descended with difficulty. That night we camped in the river-bed again, between two small streams close to where the great Sanglung spur juts out northwards. The river has thrown up a barrage here, with a deep lake against the cliff on the other side. Unless we could cross the barrage between the violent river and the deep lake, we would have to leave the river-bed altogether and climb the cliff. This is the summer route ; and had the water-line been 2 feet deeper it would have been ours too, for even at the end of November water is still pouring over the barrage into the lake. However, by felling trees and laying a bridge we just managed to get across, and so were able to continue in the river-bed for another march. A huge landslide had spoilt the scenery here for the next 2 miles, and we had some difficulty in clambering over the cyclopean angular blocks of gneiss strewn along the shore. The river was having a wild time, keeping a passage open. That night we camped in the river-bed for the last time at the foot of a smooth sheer cliff, where two streams slithered and leaped hundreds of feet into the river.

The loaded Tsangpo came up against the Sanglung cliff with terrific force, and skidded away to the west, making straight for Gyala Peri, a long shark-toothed spur of which dovetails into the Sanglung spur. It looked as though we were trapped. The roaring river filled the narrow gorge from wall to wall, and it did not look possible to scale the cliff. Just round the corner it fell about 40 feet over a ledge, sending up clouds of spray in which we saw rainbows ; it was the first vertical fall we had seen. At high water it must be an amazing sight—but then of course one cannot reach it !

On the 30th we did the apparently impossible—scaled the cliff, crossed the face of one cascade, and reached the basin of the second, high up. We followed joints and cracks in the coarse-grained gneiss, slanting up the cliff and hauling ourselves vertically upwards by means of small bushes which grew in every crevice. It seemed wonderful enough that the coolies should be able to climb such a face ; but our astonishment at this paled beside our speechless surprise when we realized that we were still on the trail of the takin !

At the top of the cliff we reached a steep stony glen not far below the snow. Here we saw a dead takin which had been caught in a noose of

THE TSANGPO GORGE FROM PEMAKOCHUNG AND THE RIDGE BETWEEN NAMCHA BARWA AND SANGLUNG

THE FIRST FALL ON THE TSANGPO

A QUIET REACH OF THE TSANGPO NEAR CAMP IX.

bamboo rope, and in its struggles to escape had fallen into the glen and broken its neck. There was forest higher up, but the slope was precipitous, and as it was now late we let the coolies seek shelter farther afield while we made the best bivouac we could on the earth slope below. It rained all night, and a cold wind blowing down the glen off the snow made the conditions generally uncomfortable; we could hardly keep the fire alight, and there was not room for us all to sit round it. Meanwhile the coolies had found a hunters' snuggery in the forest, where they kept warm and dry; consequently they were in no hurry to start next day. We got away at last, and climbed very steeply by a good path through thick forest, till we reached fresh snow. From one point we could almost see Pemakochung, which was absurdly close, and had it been clear we should have had a good view of the Namcha Barwa–Sanglung massif, and the saddle connecting those peaks.

At last, still in forest, we reached the crest of the Sanglung spur, and turned north-west; we could see the river, or rather the gorge, on both sides of us. We descended gradually, till from a clearing we were able to see cultivation far away on the left bank of the Tsangpo after it had passed the apex of its northern bend; the village is called Longyul. Shortly after that we crossed the ridge (Sechen La, 3714 feet above our last camp by the Tsangpo), and, descending a few hundred feet, camped by a pool in the forest.

On December 2 we continued the descent, bearing more and more to our right (*i.e.* northwards) along branching spurs of the main ridge, which itself ends in a cliff overlooking the river opposite Gompo Ne. There was a good path, but it became extraordinarily precipitous towards the end. In the afternoon we suddenly emerged from the forest on to a cultivated platform, and reached the so-called Monba village of Payi or Payul. Here we saw subtropical crops, bananas, limes, tobacco, chilis, and so forth.

The Monbas, though taken somewhat in flank by surprise, rallied well, and entertained us hospitably. They sold us rations, promised coolies for the morrow, and prepared quarters for us in the temple. Next day the main body of porters started back for Gyala; but the Walrus and three of the porters who had always been in the van, felling trees, fixing ropes, and generally helping the lame ducks, volunteered to accompany us to Tongkyuk. We took them on at a special rate of pay, and gave them the lightest loads; we also created a favourable impression by giving the returning party a solid reward for their services, in addition to the money which had to be paid over to the Baron of Gyala, who had contracted for the work.

Payi consists of several groups of wooden houses scattered over terraces which must be 1000 feet above the river. The people call themselves Monba, but are evidently a mixture, with Poba and Lopa predominating. Below the village, out of sight, is a rope bridge leading

to the main road on the left bank; there is no road below Payi on the right bank, which consists of a high cliff. The district down river is called Lome, that up river, Lode.

We were unable to follow the river from Payi to Lagung, where Bailey and Morshead left it on their upward journey, as time pressed; consequently that stretch of 8 or 10 miles remains unexplored. Below Payi the valley begins to open out, the spurs to flatten. Traffic is constantly passing up and down the left bank, *en route* to Showa.

Next morning an "arrow letter" was sent off to the villages of Lode, warning them of our approach and requesting assistance. We only required about ten coolies now, of which we had three; but the other seven were a lamentable time in making their appearance. Eventually we started up the path, climbing to a spur whence we had a good view of the surrounding mountains. The great snow cliff of Sanglung, which faces east, was very prominent; beyond that, separated by a gap, is a much lower snow peak, and beyond that again a group of three rocky peaks. After that the spurs flare away to the lower rounded jungle-clad Abor Hills. To the east is a broad gap, and to the north a small snow peak in Pome.

Next day, December 4, we crossed a spur called Pangkyen La, and descended almost to the river, halting at a poor little village, Sengetong. From here we had a fine view of Gyala Peri, just across the gorge, and of a range of glittering snow peaks stretching northwards from it, on the other side of the Po Tsangpo; the most conspicuous of these is Makandro. While crossing the Tsangpo by rope bridge below Sengetong we took a boiling-point in the river-bed, and found that we were 2239 feet below where we had last camped in the gorge, above the rainbow fall. Either the river loop was longer than we supposed, or there was a fall somewhere. We thought the unseen gap might be 10 or 12 miles, but that would require a steady fall of about 200 feet a mile, which was hardly credible. Having crossed the river we climbed a high narrow spur, at the summit of which we reached a village called Tsachugang. On our right, almost directly below, and plainly visible, the Po Tsangpo came galloping down from the north, and on the left the Kongbo Tsangpo went reeling away northwards, slewed sharply round a high cliff, and wriggled eastwards again. Gompo Ne and the confluence lay about 3 miles away to the south, at the end of the narrow rocky tongue on which we stood, with the rivers roaring past in opposite directions 1000 feet below us. We stayed a day at Tsachugang, and ascending the ridge had a wonderful view of the whole Assam Himalaya, with the Tsangpo bursting out from the middle. Afterwards we went down to Gompo Ne, which is at the end of the ridge, half a mile below the confluence of the Po Tsangpo with the Kongbo Tsangpo.

Gompo Ne is only a name; there is nothing there except an open shed for pilgrims and a rock which resembles a chorten. There was

said to have been a monastery here at one time, but it fell into the river. The confluence was hardly as tumultuous as we had expected to find it; but both rivers were of course low, and we were so accustomed to the wild fury of the Tsangpo that a little more or less did not make much difference. The Po Tsangpo comes in at a rather acute angle, and its blue water is instantly engulfed in the grey flood of the Kongbo Tsangpo. A boiling-point reading here gave an altitude of 5247 feet, which agrees pretty closely with Bailey's estimate of 5700 feet. We had now to account for the 1851 feet between the confluence and the "rainbow" fall (7098 feet).

Retracing our steps up the steep ridge, we crossed the Po Tsangpo some 3 miles above the confluence to a Monba village called Sengchen, where we found a colony of hunters; but to our inquiries about getting farther up the river, they said there was no route. Certainly it looked impossible. Below the village was a deep steep-sided glen filled with dense forest; the upper part of the glen was separated from the lower part by a high cliff over which the stream leaped. Across the glen a huge wall-sided spur came down from Gyala Peri to the river, and broke off short, the river itself tearing through a chasm 10,000 feet deep and at the bottom only 50 feet wide.

Our best, indeed our only, hope seemed to be to reach the crest of that spur, when we *might* see the river beyond. But how? We reckoned it would take us at least four days to cut our way there, even supposing we could do it at all. In the mean time we would have to find our own way and cut our own path, since the Monbas obstinately refused to help us, though otherwise they were quite friendly.

We began by descending 2000 feet to the river-bed in order to convince ourselves that there was no possible route in this direction. But after clambering over the boulders and along the face of a cliff till even the vegetation came to an end, we found that farther progress was only possible for creatures provided with more than the human allowance of hands and feet; not even a monkey or a cat could have clung to those walls.

We were now about ¾ mile above the confluence, and the altitude was 5302 feet. There were many steam jets issuing from beneath boulders in the river-bed, and we noticed that the coarse grey-banded gneiss of the upper gorge had changed to a finer sugary-looking schist, though it still showed the same black-and-white banding; here however the bands were straight, not crumpled. Returning to Sengchen, I climbed to the top of a grassy alp behind the village to seek a theodolite station, and noticed a good path going up the ridge. Just as I was about to descend at dusk, I saw the glow of a camp fire across the deep glen and high up on the face of the cliff where the hunters had told us it was impossible to go.

Next day (December 11) Cawdor explored the path up the ridge, and

on his return reported a good place for a bivouac high up ; the path, he said, continued. The hunters, in the face of accumulating evidence, unblushingly admitted that they had lied ; it was possible to reach the crest of the spur, and from there we should see the Tsangpo. Also they offered to take us. Their reluctance was due to the fact that this was the pet preserve of a rival tribe of Lopas, with whom they wished to keep on good terms, and who would be sore at such barefaced trespass.

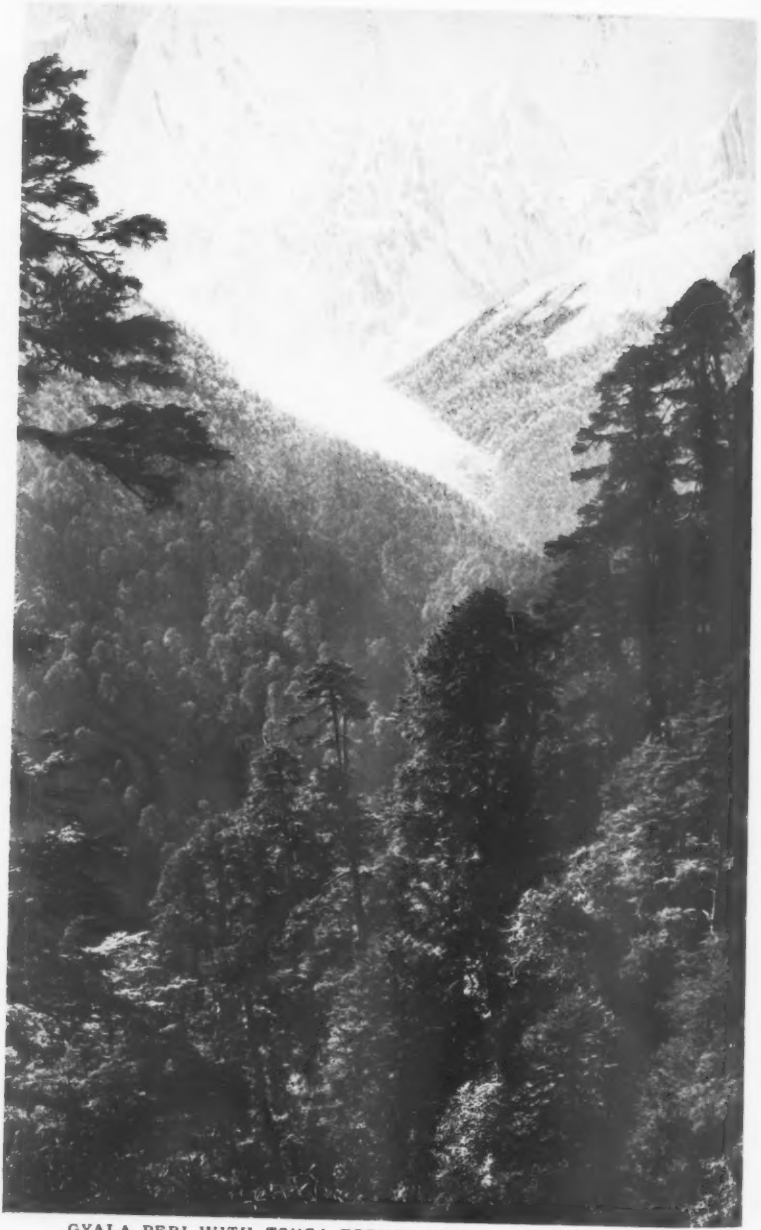
On December 12 we started, with food for five days, all the porters bringing their gas-pipe guns. For, they argued, they might as well be hanged for a sheep as a lamb. If the Lopas were going to make themselves unpleasant because they had trespassed, they might as well poach too, and have done with it. Eventually they slew two of their neighbours' takin, several pheasants, and a gooral ; and then persuaded us to write a letter to the incensed Lopas saying that we took all responsibility ! To such low intrigue is the explorer reduced !

On December 12 the weather broke again, a storm coming up from the south. We bivouacked under a rock, high up on the ridge, and awoke next morning to find it snowing hard. We began to fear that even if we reached the next ridge we should not be able to see anything.

Crossing the burn above the cascade we climbed the ridge, and early in the afternoon reached a col from where we could see the Tsangpo, 4000 feet below. There had been a terrific washout on this side, and half the face of the mountain had peeled off, allowing a superb view southwards to the Assam Himalaya, if only it had been clear. A bad descent of 2000 feet brought us to vegetation again, and we bivouacked on the precipitous hillside in twos and threes. We were told there was a big waterfall below, and next day I descended the remaining 2000 feet to the river.

Here a vertical plate of rock reached diagonally across the river, and the loaded water had blown a hole 15 feet wide clean through the middle of it. At present all the water rushed through the breach, but in flood the river pours right over the ledge, falling about 30 feet. A little below is another vertical fall of 40 feet (as near as I could judge), and altogether the river falls about 100 feet in a quarter of a mile. A boiling-point observation gave the altitude as 5751 feet. As we could not have been more than 5 miles above the confluence at the outside, this gives a fall of 101 feet a mile. That 5 miles we had all but seen with our own eyes. We still had to account for a difference of 1347 feet between this fall and the " rainbow " fall. We had seen another 4 miles up the river from the ridge above, and the gradient was extraordinarily steep ; and from above the " rainbow " fall we had seen about 2 miles down the river. If the fall here was 100 feet a mile, half the difference was accounted for ; and there might be another 4 or 5 miles of the river which was hidden from us. The Monbas said there were no larger falls than those we had seen, and that there were about seventy such falls altogether, which would easily account

THE SECOND FALL OF THE TSANGPO, GOMPO NE.



GYALA PERI WITH TSUGA FOREST FROM ABOVE SENGCHEN

for the difference of height. At any rate, we could endorse Bailey's and Morshead's conclusion, that there was no necessity to postulate the existence of a big fall in order to account for the enormous descent of the Tsangpo from the Plateau of Tibet to the Plain of Assam. We were satisfied that no greater waterfalls than those we saw existed, and that we had in fact seen the river in the deepest, steepest, and narrowest part of the gorge.

One final argument. At the lowest point reached by Bailey the altitude of the river was 7480 feet. He calculated the altitude at Gompo Ne to be 5700 feet, and the distance at 20 miles, giving a fall of 89 feet a mile (*Geogr. Journ.*, October 1914).

According to our reckoning, from Bailey's lowest point to Gompo Ne is 26 miles and the fall 2233 feet, giving an *average* of 86 feet a mile, or almost exactly the same. But this average fall is misleading, and is really made up as follows: From Bailey's lowest point to the "rainbow" fall, 11 miles, fall 382 feet, average 35 feet a mile; this includes several quiet reaches. From the "rainbow" fall to the lower fall, 10 miles, fall 1347 feet, average 134 feet a mile. From the lower fall to Gompo Ne, 5 miles, fall 504 feet, 101 feet a mile. That is to say, the river-bed is steepest where the river is doubling back on itself between Sanglung and Gyala Peri, and the rock is changing its character. The accuracy of this depends not only upon our boiling-point readings and estimation of distances, but also on our recognition of Bailey's cliff; it is therefore only approximately correct.

Next day we started back for Sengchen, reached on the 16th. The weather turned fine again, and we had magnificent views of Gyala Peri at the head of the glen, and quite close. Recrossing the Po Tsangpo, we started northwards up the left bank on the 18th. The weather broke, and after crossing the Karma La, which is the last point from which we could see the Assam Himalaya, we sat down in Lubong for two days while it rained and snowed. On the third day it cleared up, and we returned to the Karma La for a last fixing, and to photograph the snow-peaks.

Resuming the march, we reached the rope bridge above the Rong Chu confluence on the 23rd, and Tongkyuk on Boxing Day. Here we rejoined the main body, who, having waited a fortnight, were beginning to think something untoward must have befallen us. Halting a day here to pack, we started for the plateau on the 28th, following the same route as in August.

I must here draw attention to a point which struck us as curious. When we reached Gompo Ne we had undoubtedly passed through a great range of snow mountains. The Namcha Barwa–Gyala Peri line was behind, *i.e.* to the west of us. On the other hand, Namcha Barwa and Sanglung still lay to the south of us; we were not actually on the southern slope of the Himalaya any more than we had been at Gyala or Pe.

The question was, had we or had we not crossed the Himalayan axis? If so, then that axis here trends north and south, or at least north-east and south-west, and obviously we should have to recross it somewhere in order to reach the Tibetan plateau; possibly we had already done so at the Karma La, the Po Tsangpo also cutting a passage through the range. If not, then the Himalayan axis must continue eastwards from Sanglung, in the lower peaks we had seen, to be cut through by the Tsangpo further east, where that river bends to the south. In that case, what about Gyala Peri, Makandro, and the other snow peaks on both sides of the Po Tsangpo? To what range do they belong? It is a nice problem for geologists as well as geographers, which we can state but cannot solve; the information is still too meagre.

Arrived at Nambu Gompa, which had been long since deserted, we waited two days in the hope of fixing the high peaks on the Salween divide; but a continuous fall of snow prevented this, and we decided we had better cross the pass before it was blocked. From the Nambu La therefore we descended to the Trasum Lake and Shoga Dzong, the snow-storm continuing for five days.

Then, retracing our steps up the Drukla valley as far as Pungkar, and finding that we could not get over the Trasum Kye La, we returned to Shoga and continued down the river to Namse Gompa, on the Gyamda river. Turning westwards we reached Gyamda three days later, and made an excursion up the valley to Ko Gompa beyond Laru, whence we returned to Gyamda. We could probably have crossed the Tro La and reached Atsa, but time was getting on now, and we were due back in India shortly.

On January 24 we finally left Gyamda, following the Lhasa road for three days, over the Kongbo Pa La, 18,022 feet, to Tsumara. Here we turned due south, crossing a low pass, the Kumba La, from where we had a view of the snow peaks east of Oga Dzong, which was reached on the following day. Following the main road up the left bank of the Tsangpo, we reached Tsetang three days later (January 31), crossing by the ferry just below the town.

Between Tongkyuk and Tsetang we kept a route traverse, checked by ten observations for latitudes, and boiling-point observations on the passes.

No time was wasted at Tsetang. On February 1 we started due south for India, following Bailey's and Morshead's route up the Yarlung valley and so over the Yartö Tra La, 16,700 feet. Keeping just east of the Trigu Tso, between which and us were some fine snow peaks, we crossed the Kale La and came down to the headwaters of the Subansiri. We were on new ground all the way from the Yartö Tra La to Tsöna, though we crossed Bailey's and Morshead's east-west routes at more than one point. The weather was bright and bitterly cold, fierce winds springing up after eleven o'clock each morning. The valleys of the upper Suban-

siri, though well populated, looked very barren, and choking dust-storms made travelling uncomfortable. But there was very little snow till we crossed the Debshi La, over 16,000 feet, and approached the main Himalayan range. After skirting the Nera Yü Tso in a thick snow-storm, we crossed the Torgon La and reached Tsöna Dzong on February 7.

We had to halt here a day, and were told that the Tawang route was blocked. On the 9th we started again, following Bailey's and Morshead's route, crossed the last pass called Pö La, 14,900 feet, and descended once more into forested country, in the valley of the Nyamjang Chu. Two days later we finally left the snow behind us.

We now followed the river southwards into Eastern Bhutan, where we were well received, especially at Trashigang Dzong. Thence we reached the plains in six days, and Rangyia railway station the same night, February 23, having done the last 25 miles across the plain by Ford car.

The geographical results of the expedition may be briefly tabulated.

(i) Discovery of a new route from Trap, on the Tsangpo, *viâ* Öga Dzong, the Lung La, and Chögorche, to Gyatsa Dzong; and from Trap, northwards *viâ* Öga Dzong to the Lhasa road at Tsumara.

(ii) Exploration of the Gyamda valley from Tsela Dzong to the Lhasa road at Gyamda; and of its chief tributary, the Shoga Dzong stream.

(iii) Discovery of Drukla Gompa, the Drukla river, and the Trasum Kye La, with the route from Shoga Dzong to Atsa.

(iv) Exploration of the Trasum lake, and of the route *viâ* the Nambu La from Shoga Dzong to Tongkyuk.

(v) Exploration of the Nam La.

(vi) Exploration of the Tsangpo gorge from the lowest point reached by Bailey to Payi, and the discovery of two small falls; and of the Po-Tsangpo from Gompo Ne to Trulung.

(vii) Exploration of the route due south from Tsetang to Tsöna Dzong.

Our botanical discoveries are dealt with elsewhere.

Before the paper the PRESIDENT said: We welcome back this evening, after a journey extending over a year, our lecturer Mr. Kingdon Ward, no stranger to the platform of our hall. In the course of his last journey Mr. Kingdon Ward and his companion, Lord Cawdor, completed the exploration of the great bend of the Tsangpo River which was begun between forty and fifty years ago by one Kinthup, a native employed by the Survey of India. Let me remind you in a few sentences of the story of the exploration of this river. In 1879 it was determined that an attempt should be made to decide once for all whether the Tsangpo of Tibet and the Brahmaputra of Assam were parts of one and the same great river. A Chinese Lama, trained as an explorer, was therefore despatched to Tibet with instructions to follow the course of the Tsangpo River as far as he could, and then to throw into its waters specially

marked logs of wood. For two years careful watch was kept on the waters of the rivers of Assam. The watch proved to be vain, and the reason became apparent four years later, when Kinthup, who had been in the service of the Lama, made his appearance once more and reported to the Survey of India. It seemed that the Lama had played his employers false, and had sold Kinthup himself into slavery. The latter, after gaining his freedom, made his way down the course of the river as far as he could, and then threw the logs into its waters. But the watch upon the rivers of Assam had by then been abandoned, and it was not until 1913 that the general accuracy of Kinthup's report was verified by Captains Bailey and Morshead. These two explorers went far to solve the problem of the great bend of the river, but they left a piece of some 30 miles of stupendous gorge untraversed, and it is that gap which our lecturer this evening will be able to fill in. In the course of his journey he covered the larger part of these immense gorges, and so has solved for all time the problem of the Tsangpo and the Brahmaputra rivers; and in the expectation that he will devote no small part of his lecture this evening to describing these hitherto unknown and most interesting tracts of country I have great pleasure in calling upon Mr. Kingdon Ward to tell us his story.

Mr. Kingdon Ward then read the paper printed above, and a discussion followed.

Sir DAVID PRAIN: The lecturer has told you that he has been to ferret out the geographical features of one of the last-explored bits of the globe; and he has done the same thing for the plants. We were just as interested to know what species might be brought from that gorge and the country behind it as you were to know what sort of country he saw. He has told you that in all Alpine lands the plants look very much the same, that the plants that he saw on those high alps were very much like the plants you have seen in Switzerland. Although that is perfectly true as far as general appearance goes, it is also true that there is the very greatest difference in detail. We knew very well what could be got from Sikkim and Chumbi, and also, thanks largely to Mr. Kingdon Ward, what could be got from Szechwan and Yunnan. We knew also that in this particular area, which is, roughly, about halfway between Yunnan and Szechwan on the one hand and Sikkim and Chumbi on the other, his party would get the same kind of plants, but that they would also probably get plants differing from those either to the east or west. Mr. Kingdon Ward has told you that amongst the mountain poppies, of which there are about forty altogether—half of them being in the Himalayas and the other half in China—they have ten, most of which are new. And the same with rhododendrons. There are sixty or seventy sorts in Sikkim, and I do not know how many—Mr. Kingdon Ward might know—probably something like three hundred in the south-west corner of China; but I have not the slightest doubt that amongst the seventy or eighty he tells us he has seen a very considerable number will be different from those that he and others have already brought from south-west China and from those we know from the Himalayas. I think that although you as geographers are very much to be congratulated on having heard what Mr. Kingdon Ward had to say to-night, those of us who are interested in botany and gardens regard him as one of ourselves, and are even more interested in what he has said and what he has done than you can be.

The PRESIDENT: After the botanist I had perhaps better invite a geographer to speak. Colonel Ryder of the Survey of India is present, and no one can speak with more authority than he, if he will be kind enough to do so.

Colonel C. H. D. RYDER: Besides the many years that I have spent in the Survey of India, my particular claim to talk on this especial portion of the Himalayas is that I nearly, but never did, go there. During Sir Francis Younghusband's Expedition to Tibet we were all, naturally, very keen to explore in any direction that we could. He had organized expeditions up the Brahmaputra, which I joined, and an expedition, to the command of which I was nominated, down the Brahmaputra, which unfortunately was entirely stopped by orders from home and from the Government of India; so that that part remained really an entirely unknown country until Major Bailey and Major Morshead of the Survey of India made their exploration thirteen years ago. They were preceded only by that well-known traveller, the Indian Kinthup. All the Indian surveyors that we sent up into Tibet in olden times, with one exception, namely that villainous Lama whom Lord Ronaldshay mentioned, were successes; they all did their work in a most excellent manner. Old Kinthup was discovered a few years since living in humble circumstances in Darjeeling. He died only a year or two ago, but I think his end was made happy by the recognition that he received, pecuniary and otherwise, from the Government of India.

The controversy on the problem of the Brahmaputra was an old-standing one. If you study the proceedings of this Society forty or fifty years ago, you will see many very heated arguments used to take place as to which river the Tsangpo of Tibet became. A predecessor of mine, a very distinguished Surveyor-General of India, used hotly to maintain that it became the Irrawaddy. He was wrong. It is only by the wonderful energy, the tact and skill of explorers such as Majors Bailey and Morshead and Mr. Kingdon Ward in this particular locality, that we finally arrive at the solution of these problems. I think that geographers as well as botanists are to be congratulated on the lecture which has been delivered this evening.

Sir FRANCIS YOUNGHUSBAND: Twenty-one years ago, when we were at Lhasa and the Treaty had been concluded, we thought we would take the opportunity of solving the great question of the Tsangpo River—both where it came from and where it went to. And so, finding the Tibetan Government were in an entirely friendly mood, we approached them and obtained permission to send two expeditions: one to go up the Tsangpo and discover its source, and the other down it to see if it was the same as the Brahmaputra. Colonel Ryder was told off to the expedition which was to go down the river and decide, once for all, whether the Tsangpo which we crossed on the way to Lhasa did force its way through the Himalaya Mountains and become the Dihong (or Brahmaputra) in Assam. The Tibetans said, "You can go down the river. We have not the foggiest idea where it goes to, but if you like to take your chance of coming out somewhere at the other end, very well, we shall be prepared to help you along." It would have been a risky expedition. It could get through the Tibetan portion, but what sort of reception it would meet with amongst the tribes between Tibet and Assam was uncertain; and for that reason the Government of India thought it would be best to await a better occasion. That occasion came when Major Bailey made that adventurous journey up the Dihong to the gorges and found it practically certain that the Tsangpo and the Dihong were the same. Nevertheless, there was a gap of about 30 miles remaining, and it has been most delightful to sit in a comfortable armchair and see that gorge being disclosed to us by photographs as a result of the remarkable journey which Mr. Kingdon Ward has described. We now have in detail, right from one end to the other, the whole history of the Tsangpo.

I think we are to be congratulated upon those two very adventurous explorers, Major Bailey and Mr. Kingdon Ward, and their companions, Major Morshead and Lord Cawdor. I must also congratulate Mr. Kingdon Ward both upon his adventurous journey and upon the beautiful photographs he has shown. I am sure some of the geographers present are also flower lovers, and we shall be only too delighted to hear more of the wonderful flower world which he has disclosed.

The PRESIDENT: I would like on your behalf to thank Mr. Kingdon Ward for his most interesting lecture this evening. It has, indeed, fallen to his fortune to solve finally one of the few problems of exploration which the nineteenth century left to the twentieth century for solution. He has finally confirmed two things: first, that the Tsangpo does make this tremendous right-angled turn to force its way across the main axis of the Eastern Himalaya Mountains; and, secondly, that it does that somewhat unexpectedly, without any very outstanding fall of water taking place in the process. So far as one can judge from what Mr. Kingdon Ward has told us this evening, there is no huge waterfall at any part of the course of the river where it makes its way through the mountains, but it does so with a more or less steady descent through this stupendous 30-mile gorge which he has so well described. It is a matter of regret to Mr. Kingdon Ward, as it must be to us also, that his companion upon this adventurous journey, the Earl Cawdor, is not present to-night. Lord Cawdor, I believe, reached England safely yesterday, but after a period of a year amid the comparative solitude of the Eastern Himalayan Mountains and of Tibet it seems that the attractions—and of course to a Scotsman they would be great—of the Caledonian Ball have been too much. An engagement to take part in that function has deprived us of the pleasure of his presence this evening. None the less we do most heartily congratulate him and Mr. Kingdon Ward, the seasoned traveller of the party, upon the splendid results of their most recent expedition.

Sir Louis Dane sends us the following note as a contribution to the discussion:

The remarks of Colonel Ryder and Sir Francis Younghusband at the meeting on May 25, no doubt unintentionally, may have raised the idea that the Government of India were obstructive as regards the exploration of the Tsangpo after the Mission to Lhasa in 1904. I should have liked to correct this impression at once, but the hour was late, and I was not favourably placed for saying anything. The facts are that the Government of India were most anxious to facilitate the exploration of the territory in Tibet adjoining the Indian frontier, and especially that on the Nepal border, as the Nepalese Government were nervous about the movements of Russian emissaries in Tibet. Sir Francis Younghusband was therefore asked if he could induce the Tibetan authorities to issue safe conduct for one surveying pary to proceed from Lhasa to Gartok to open the trade mart there in Western Tibet and to return down the Sutlej to Simla, and for another party to descend the Tsangpo to Assam. There was a little trouble with the Abors at the time, and it was thought that the Tsangpo party might be accompanied by the Gurkha regiment returning to Assam. It was hoped that the attention of the Abors would be kept on the Assam front by operations there, and that the Gurkhas arriving unexpectedly in the rear from Tibetan territory would secure the opening up of the whole country. Sir Francis Younghusband duly obtained the safe conduct for the parties, but the military authorities raised objections to the Gurkhas returning by the Tsangpo, and it was not considered safe for the

survey party to proceed unescorted through Abor territory; consequently that exploration fell through, and it remained for Captains Bailey and Morshead and Mr. Kingdon Ward to clear up the Tsangpo mystery. It is interesting to find that there are considerable falls on the Tsangpo, but, as in the case of the Sutlej and other rivers cutting through the central Himalayas, they are rather continuous rapids than high perpendicular falls. It is also interesting to find that tribal territory under Tibetan influence lies to the south of the Tsangpo gorge, so that perhaps the Gurkhas could have safely accomplished their return journey and a troublesome and somewhat costly Abor expedition might have been saved. But the risks of the unknown were no doubt serious. The western exploration though arduous was in every way successful, and, as was hoped, did much to clear up the status of Mount Everest.

Very few of the authorities probably knew much about Gartok, or even where it was; otherwise we might not have secured our trade post there. My personal knowledge of Gartok dates back to 1883, when I was in charge of the Kulu subdivision of the Kangra District. It was reported that an emissary of the Garpun of Gartok was collecting dues in British territory from the Kampa and other traders on the threat that unless they paid they would not be allowed to enter Tibet. He was detained and an order from the Garpun and several hundreds of rupees found on him. His story was that the Garpun had sent down a flock of sheep with borax for sale, and the man in charge went off with the price, so the Garpun decided to recoup his loss in this way. I reported the circumstances, and added that, if the Government would permit me to leave Kulu for three months, I was willing at my own risk to take the Garpun's emissary and some Spiti Tibetan horsemen with me to ascertain if the story were true, and that in this way travelling lightly by the Parang La route we might explore the country to Gartok, and even beyond, without being stopped. The Punjab Government was not adventurous. I was told I must not leave my subdivision. If an offence had been committed the case must take its course, and so on. Law was not at a premium in Spiti, and the emissary was allowed to depart in peace. Now we have an agent in Gartok, and know all that there is to be known about the goldfields and other points of interest in that desolate but not unimportant tract. Perhaps this note of my recollection of the facts may be of sufficient interest to warrant its being added to the discussion.

THE FIFTH THULE EXPEDITION, 1921–24

The Danish Ethnographical and Geographical Expedition from Greenland to the Pacific

Knud Rasmussen, Ph.D.

Read at the Meeting of the Society, 9 November 1925. Map follows p. 192.

WHEN you are driving a dog team through the desolate region of the North-West Passage, you do not often meet another sledge. But I once had that experience myself, and I think it may interest you to hear about it. I was coming down past the Kent Peninsula on my way to Coronation Gulf when I had the good fortune to

meet the Royal Mail on another sledge, which had come across the Mackenzie River with the Canadian Mounted Police. What is more, there was a letter for me; and, what is very much more, that letter was from the Royal Geographical Society, to say that the Society had conferred on me the very distinguished honour of the Founder's Medal. It would be out of place for me to speak of the value of such an award. Every one knows that there is no higher authority on geographical questions than the Royal Geographical Society of Great Britain. It had been my great good fortune to travel in the footsteps of nearly all the great classical Arctic explorers of this country, both in Greenland and in the region of the North-West Passage. My own impressions and experience in the field in which they worked before me have given me, I believe, some appreciation of their work, and of what it meant to the cause of geographical research. And with this in mind, I cannot but feel the more grateful, and the more honoured to find myself in this distinguished company. I received the news of the Royal Geographical Society's award while actually engaged in my work of exploration. It found me quite literally on a journey. And I hope you will understand me when I say that I shall always feel it as obligation to go on; to continue the journey as long and as far as I am able.

Few people realize the enormous importance of the part played by Eskimo in Arctic exploration. The Eskimo people are few in numbers—only some thirty-three thousand souls in all—but they are scattered over half the circuit of the globe, from East Greenland to the Bering Sea. Throughout the whole of this wide region they carry on a continual struggle for life, armed and equipped only with such weapons and implements as they have made for themselves, and adapted to the natural conditions under which they live.

Look back for a moment through the history of Arctic exploration, and consider what a reputation these Eskimo have gained for themselves as travellers and helpers, dog drivers and hunters. You will, I am sure, agree with me that geographical research is deeply indebted to this remarkable people. And I think, therefore, that an account of their history will not be out of place in a geographical society.

Having myself the honour, as a Dane, of addressing you this evening, I should like first of all to point out how Englishmen, Canadians, Americans, and Danes all meet in this field. For generations past we have all been engaged upon the same task of geographical exploration, and in the course of this work we have all helped to procure information as to the life and customs of the Eskimo with whom we came in contact.

It will, I think, be admitted that the study of Eskimo life and history is one in which Denmark should naturally take a prominent part. For over two hundred years the fate of the West Greenland Eskimo has been in our hands; and since 1921 the whole of Greenland has been a Danish colony. The general knowledge of Eskimo culture which has

LIMESTONE RANGES, PHILIPS CREEK, COCKBURN LAND

TERTIARY LOWLAND, POND'S INLET

MOUNTAINS OF PRIMITIVE ROCKS, ALBERT HARBOUR, POND'S INLET

EAST CAPE, SIBERIA

RUINS OF HOUSE OF THULE PERIOD

EDGE OF PLATEAU, NORTH COAST OF BAFFIN ISLAND

penetrated to the outer world is very largely due to the literary and scientific work of Danish investigators. I will mention a few of the most important items.

The classical works of the eighteenth century on Eskimo life and culture are almost entirely Danish. The first detailed description of an Eskimo tribe is that of the missionary Hans Egede, dealing with the West Greenlanders. His son, Paul Egede, continued the work, with an intimate understanding of the Eskimo, their ways of thought and feeling, which very few have equalled. The diaries of Glahn, the priest, and the account written by the trader Dalager, still in the eighteenth century, afford material of permanent value. Otto Fabricius, again, who was not only a priest but also a naturalist, has given an excellent account of the Eskimo's hunting implements and their methods, as good as any modern ethnographer could give.

In the nineteenth century, it is likewise a Dane who lays the foundations for a scientific study of the Eskimo. This was Dr. Henry Rink, the first to make systematic collections of Eskimo folk-lore. He was also the first to use his knowledge of the people for comparative investigations into the origins and development of Eskimo culture. And finally, in our own times, we have Gustav Holm, who has described the hitherto unknown Eskimo of Angmagsalik. His work on the culture of these people is recognized throughout the world as the very model of an ethnographical monograph. You will, I think, consider it only natural that I should make special mention of Danish work in this field.

All this, however, deals solely with Greenland, Outside Greenland, no Dane had as yet worked with the Eskimo. But in that enormous region covered by the coast of the Arctic from Davis Strait to the Pacific, a number of English and American travellers and explorers had been at work. We find here, first of all, the many great names from the days of the North-West Passage expeditions: Ross, Franklin, Back, Dease and Simpson, Rae, M'Clure, M'Clintock, Collinson, and in recent years, Amundsen. These explorers, of course, had other objects in view than the study of the native population; all the same, they made some valuable observations. There are two names in particular I wish to mention here, as associated with the region where we made our own headquarters. These are Parry and Lyon. The work of these two British naval officers, over a hundred years ago, is marked by a wealth of information, and a degree of accuracy, which can only be fully appreciated by those who have covered the same ground. And this applies to their ethnographical work as well.

But the most valuable ethnographical material dealing with the Eskimo outside Greenland is to be found in a series of monographs chiefly of American origin. Some of them are published by the Bureau of Ethnology at Washington, and some by the Museum of Natural History in New York. Among them I would mention Turner's work

on Ungava Bay, that of Murdoch from Point Barrow, and that of Nelson from the Bering Strait. Most of all, however, the work of Frantz Boas.

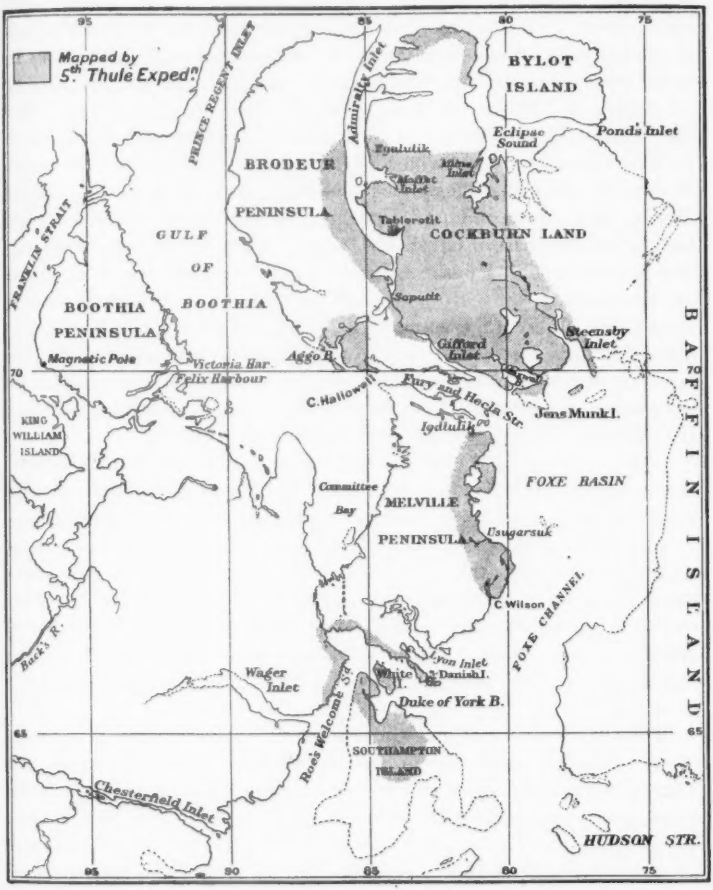
And finally, it must not be forgotten that Canada has of late years taken an active part in the work, in sending out the Canadian Arctic Expedition under the leadership of Vilhjalmur Stefansson. Stefansson's own books, as well as Diamond Jenness's description of the Copper Eskimo, are works of great importance in Eskimo literature.

Despite all this, there was plenty of work still remaining to be done. And we were anxious to take a hand in it ourselves; to bring Danish ethnography closer into line with English, Canadian, and American research. It was this which led to the starting of the Fifth Thule Expedition, under the patronage of His Majesty the King of Denmark. The Committee of the Expedition consisted of the following: M. Ib Nyeboe, Chairman; Chr. Erichsen, Major J. P. Koch, Professor O. B. Boeggild, Professor Ad. S. Jensen, and Professor C. Ostenfeld, all of the University of Copenhagen, and Th. Thomsen, the Inspector of our National Museum.

The actual members of the Expedition were: Peter Freuchen, cartographer and zoologist; Therkel Mathiassen, archæologist and ethnographer; Kaj Birket-Smith, geographer and ethnographer; Helge Bangsted, scientific assistant; Jacob Olsen, Greenland secretary and interpreter; with myself as leader and ethnographer, specializing in folk-lore. The expedition also included six Cape York Eskimo, from North Greenland, three of them men and three women. Their special business was to take over the work of hunting and procuring game, making and mending clothes, and such like, so as to leave us free to concentrate on the scientific work. Their task was of course an important one in those regions. And these Cape York Eskimo worked splendidly, answering in every respect to our expectations. The expedition was later joined by Leo Hansen, at Kent Peninsula, in 1923; his work was to act as special film photographer to the expedition.

Before going on to describe our actual journeys and their results, I should like to take this opportunity of expressing my very hearty thanks to the British Foreign Office and the High Commissioner for Canada, who showed the greatest interest in our undertaking, and helped us in many ways from the very first. And finally, also to the Hudson's Bay Company, which has posts in various parts of the country through which we had to pass. There are wide regions where the Hudson's Bay Company's stations form the only link between the native population and the outer world. The Hudson's Bay Company stands for civilization, and its outposts in these desolate lands represent the life and work of men who bear the white man's burden, the white man's great responsibility.

The expedition started in the summer of 1921, on board the little schooner *Soekongen*, sailing, to begin with, northwards along the west coast of Greenland to North Star Bay. My fellow-countryman, M. Ib



Sketch-map to show the country surveyed by the Fifth Thule Expedition under the direction of Dr. Knud Rasmussen, 1921-24.

This map has been reduced from that published by Dr. Rasmussen in the 'Geographical Review' for October 1925. *It is there described as a preliminary map, subject to correction when the material is completely worked up. The western coast of Melville Peninsula is shifted more than a degree to the east, while the longitude of Admiralty Inlet is little changed, though the inlet is extended much farther south. All the detail in the interior of Cockburn Land is new, as are the east coast of the Melville Peninsula and the north of Southampton Island.*

Nyeboe and I had set up a station here in 1910. It was the most northerly permanent station in the world, and we therefore called it Thule—after the " ultima Thule " of the ancients. This station has formed the basis of all my expeditions since then, and our present expedition takes its name from being the fifth which has set out from there. The Eskimo inhabiting this district are those whom Sir John Ross in his day called the " Arctic Highlanders." I have been in contact with them myself for over twenty years, and consider them the best travellers in the world. It was from these that the native members of the expedition were chosen. Having taken them on board, together with seventy-five dogs, we sailed back along the coast of Greenland, crossed Davis Strait from Godthaab, and passed through Hudson Strait into Fox Channel. Here we set up our headquarters on a little unknown island between Frozen Strait and Lyon Inlet. West of Southampton Island we encountered such enormous masses of pack ice that we only just managed to scrape through. We called the island Danish Island, and as it lay in a good central position for our various journeys, we built there a small house for winter quarters. We called it " Blaesebaelgen," which means the bellows.

The principal object of the expedition was to study the Eskimo. But in addition to this we had also others, such as cartographical, geographical, and geological investigations, meteorological observations, as well as botanical, zoological, and especially ethnographical, collections. At the conclusion of the expedition these collections numbered twenty thousand items, of which fifteen thousand were ethnographical, covering the whole of the country inhabited by Eskimo between Baffin Island and the Yukon Delta. These collections were stored in depôts at various places, and brought home by the Hudson's Bay Company's vessels.

The lines on the chart show the routes followed by the various members of the expedition on their individual journeys. Peter Freuchen and Therkel Mathiassen spent two winters covering the country from headquarters up to Baffin Island, and Mathiassen went back from here, returning to civilization along the coasts of Baffin Island and Labrador. Freuchen made his way across Baffin Bay to Greenland, and returned to Denmark from there.

Birket-Smith, Helge Bangsted, and I went down to Chesterfield Inlet, and from there on up into the interior; we did not get back to headquarters until the autumn of 1922. In the following winter and summer, Birket-Smith went home along the west coast of Hudson Bay, one of his objects being to study the Chipwyan Indians, who are neighbours of the Eskimo in that region.

Our ethnographical work required, of course, that we should come into contact with as many as possible of the different Eskimo tribes, and I therefore chose another route home for myself, taking with me only two Eskimo—a man and a woman. Our line lay through the North-

SUNRISE OVER THE NORTH-WEST PASSAGE, NEAR KENT PENINSULA

MAN FROM BAILLIE ISLAND WEARING LABRETS

MAN FROM REPULSE BAY

OLD WOMAN FROM POINT BARROW, ALASKA

West Passage, all along the north coast of Canada, round the north of Alaska and across the Bering Sea to Siberia.

All these journeys taken together make up a total distance which we estimate at not less than 20,000 miles. This distance we covered in a comparatively short time—from 1921 to 1924—without a single mishap, and accomplishing all the objects we had in view. That we were able to do so is, I consider, very largely due to the steady co-operation and good fellowship which prevailed among all members of the expedition from first to last. My comrades knew what they had to expect, and what was expected of them; they knew their duty and they stuck to it. I need not point out how much this means when organizing expeditionary work in largely unknown country. And what I have said applies to our Eskimo comrades no less than to the rest.

We are all of us now hard at work on our material, and I am sure every one here will understand that I cannot at present give more than a brief outline of our results. And even if I could, it would take too long to go into details.

Accustomed as we were to travelling in Greenland, we had little difficulty in making our way through Canada and Alaska. On journeys of such length we were, of course, often obliged to live on the resources of the country. But I may say that we never had much difficulty in finding and procuring such game as we needed. The whole journey from Hudson Bay through the North-West Passage, Canada, and north of Alaska was accomplished with the same single team of dogs. So there is very little to offer you in the way of terrible hardships or narrow escapes. Our greatest trouble was the constant snowstorms, but we got used to those in time. It is not much good going to Arctic Canada if you only want to travel on fine days.

As the leader of the expedition myself, I think it is due to my comrades that I should give a general survey of the whole work of the expedition, rather than confine myself to any particular part of it. I shall therefore put before you briefly the results of our work in the various fields: geographical, archæological, and ethnographical.

Geographical.

This section was in the hands of Peter Freuchen and Therkel Mathiassen, who made their journeys by dog sledge, often working under very adverse conditions. Very briefly, their results are as follows:

Northern Baffin Land.—The coast-line from Cape Hallowell to Aggo Bay inclusive was surveyed and mapped; also the southern half of Admiralty Inlet and the overland route from there to Gifford Inlet; Murray Maxwell Bay and Steensby Inlet, with the country between this and Milne Inlet. All this was previously uncharted ground. In other parts, the existing maps have been revised and improved as regards

OLD WOMAN FROM POINT BARROW, ALASKA
MAN FROM REPULSE BAY
MAN FROM BAILLIE ISLAND WEARING LABRETS

the range from Gifford Inlet to Cape Hallowell and the country round Pond's Inlet.

They also obtained from the Eskimo a great deal of information regarding the configuration of the country, partly based on charts made by the Eskimo themselves.

As regard physical geography, the most important physical features noted are as follows :

Five different types of formation were observed. Firstly, low, slightly broken, level plateaux of primitive rock, rarely over 200 metres above sea-level. This section comprises the north coast of Fury and Hecla Strait, the southern part of Admiralty Inlet, and the base of Steensby Inlet.

Secondly, high plateau formation of primitive rock, falling steeply away to the sea and fjords. This includes most of the country north of Eclipse Sound, with Pond's Inlet and Bylot Island. In the southern part of Milne Inlet the altitude is about 400 metres ; from here the land rises towards the east, reaching 800 to 1000 metres south of Pond's Inlet, and on Bylot Island even higher, up to 2000. The high country is partly covered with ice.

Third, low Silurian limestone formation, partly covered with moraine and marine deposit. This includes the greater part of Jens Munk Island and the country west of Steensby Inlet.

Fourth, high plateau-like Cambrian-Silurian formation of sand and limestone, 200 to 400 metres high, falling away steeply towards the valleys and inlets. This includes the Brodeur Peninsula, the country round Tablerotit in Admiralty Inlet, and the country between Admiralty Inlet and Milne Inlet.

Finally, low Tertiary formation covered with loose masses of moraine and beach deposit, with carboniferous strata showing through at the base of some of the crevasses. This includes part of the western side of Bylot Island, and the country round Pond's Inlet.

At Eqalulik, in Admiralty Inlet, they found a number of loose blocks of newer eruptive rock, suggesting a volcanic formation above the Silurian. A considerable number of fossils were found in the limestone.

That the country was covered with ice during the Glacial Period is proved by the presence of moraines and frequent finds of rock with scour stripes, or glacial striation, showing the direction in which the ice moved outward from the centre of the land. This is presumably the origin of the great fjords and inlets. Since the Glacial Period the land has been submerged by the sea. At Saputit, in Admiralty Inlet, a rich marine fauna was found in raised sand strata. The highest points reached by the sea here at Pond's Inlet are 200 metres up, but west of Milne Inlet beach formations were found 400 metres above present sea-level.

Melville Peninsula.—The map of the east coast from Cape Wilson to Igdlulik and the south coast from Repulse Bay to Vansittart Island

has been revised and corrected. We find here two types of formation:

Firstly, slightly broken country, mostly in low plateaux of primitive rock, rarely rising above 150 to 200 metres. This type comprises the greater part of the peninsula.

Secondly, Silurian limestone formation, in a fringe along the north-western part of the peninsula, from Usugarsuk to Igdlulik. The country here is low-lying, and composed of raised beaches and limestone blocks.

A great number of fossils were collected here. Scour stripes and raised sand strata were found everywhere, and a rich mollusc fauna.

Southampton Island.—The land west and south of Duke of York Bay, with White Island and the interior between Duke of York Bay and South Bay, was surveyed and mapped. We find here the same two formations as on the Melville Peninsula. Firstly, the primitive rock plateaux up to 500 metres high; this includes White Island and the north-eastern portion of Southampton Island itself.

Secondly, the Silurian again. This is flat, often with loose blocks of limestone, presenting the appearance of a desert. Fossils were collected; rocks with glacial striation were observed at Duke of York Bay. Raised beaches were observed at a height of 360 metres, and form a regular feature of the landscape here.

Archæology.

One of the principal objects of the expedition was to study the Eskimo culture from an archæological point of view, so as to form an idea of its development, and thus throw light on the question as to how the Eskimo first made their way to Greenland. The excavations were made by Therkel Mathiassen, and I will here give you a summary of his results.

The whole of the Hudson Bay area was in ancient times inhabited by an Eskimo population. But their culture was of a very different character from that of the Eskimo tribes we now met with. Its very foundation, indeed, is altogether different. The Eskimo of this older period looked to the sea for their means of subsistence, hunting seal, walrus, and especially the whale. The present inhabitants, on the other hand, are far more dependent on land animals. Consequently, they live a nomadic life, following the herds on their migrations up-country during summer and autumn. Only in winter and spring are they to be found on the coast, hunting seal from the sea ice. The Eskimo of the old days lived in regular houses during the winter, assembled in fixed settlements, whereas the present inhabitants have no winter quarters beyond their snow huts, which they can build anywhere.

This ancient period of Eskimo culture, which extended at any rate from Chesterfield Inlet to Pond's Inlet, we have called the Thule Period. Our reason for giving it this name was that the first finds of material from that period were made near the station of Thule, in Greenland.

And it would seem that the land at that period lay about 10 metres below its present level. For the site of these ancient settlements is about 12 to 20 metres above the sea-level, and about 100 or 150 metres from the shore. The Eskimo would never think of carrying heavy building material, such as the bones and skulls of whales, farther than was necessary, especially up a slope. For this reason we conclude that the land must have risen since then. And the numerous raised beaches found there also suggest that the land must have risen in a comparatively short time.

This ancient form of culture, represented by the permanent winter houses built of turf and stone and bones of whales, afterwards gave place to a new form, which seems to have originated in the interior, about the Barren Grounds. I shall give my reasons for this view later on.

The culture of the Thule period can be traced all along the coasts which are now, or have been at some time, inhabited by Eskimo. We find it in the ruins of their dwellings in Greenland, Baffin Island, and Labrador, and in the west, all through the North-West Passage to Alaska and the Bering Sea. In King William Island, for instance—a region where no permanent winter dwellings have ever been found before—I found the remains of a great settlement, numbering some seventy houses, of the Thule period. Another fact which here points to a rapid rise in the level of the land is the finding of skeletons of whale and white whale, with pieces of driftwood, several miles inland.

Our archæological investigations, then, show that a culture of uniform character, superior to that of the present day, at one time prevailed throughout the whole of the region from Alaska to Greenland. And also that, after being superseded by that of the present-day Eskimo, it still continued to exist in outlying districts, in the more Arctic regions of Point Barrow and Cape York.

The Caribou Eskimo.

It remained, then, for us to ascertain the origin of this inland culture, which we had thus found in its transition state on the coasts.

The people in the neighbourhood of our headquarters were the so-called Aivilingmiut and Iglulingmiut; the same tribes that were described so admirably by Parry and Lyon. And these people now told us that up in the interior, some distance inland from Chesterfield Inlet, there lived a strange tribe who spoke the same language as they did, but who never came down to the coast.

I therefore set off at once, the first winter, for the Barren Grounds. After a toilsome sledge journey of two months we reached the great lake of Yathkyed, and found there an inland tribe, no record of which had ever appeared, and many of whom had never even seen a white man. The reason of this isolation is as follows:

The Barren Grounds consist of an early rock formation mostly buried under a layer of moraine deposit: clay, sand, and gravel. Even to this

CARIBOU ESKIMO

MEMORIAL CAIRN TO MEMBERS OF FRANKLIN EXPEDITION, STARVATION COVE, ADELAIDE PENINSULA

CHIPEWYAN INDIANS SMOKING DEER-MEAT

IGLULIKS BUILDING A SNOW HOUSE

day it is one of the most inaccessible parts of the globe, though actually forming part of the continent of America. On the north and north-west we have the North-West Passage, which is always blocked by ice; and on the south there are forests of enormous extent, making a long and extremely difficult journey on that side. Only to the east is the country open for modern methods of transport, and even here the ice of Hudson Strait and Hudson Bay often makes travelling all but impossible. It is therefore only natural that this region, with its many lakes and minor rivers, should have remained in isolation. The winter is bitterly cold, with fierce gales, and in summer the country is a stretch of moist, bottomless tundra, very difficult to cross. The best way is to go by canoe along the rivers, but these again are often shallow and full of rapids.

The only scientists to come in contact with these remarkable people of the Barren Grounds before ourselves were the Canadian geologist, George Turrell, who was there in 1893 to 1894, and the Englishman, David Hanbury, from 1898 to 1901. Neither of them could speak the Eskimo tongue, and they were therefore unable to make any study of the people. To these Eskimo of the Barren Grounds we have given the collective name of Caribou Eskimo, because their whole mode of life is dependent on the reindeer, or caribou. I will give you briefly the results of Birket-Smith's and my own researches among these people.

We soon realized that we had here to do with a culture of inland origin. The whole of our material, Eskimo tradition, ethnographical and archæological facts, all pointed in the same direction. These Eskimo are entirely independent of the sea. They were, indeed, so entirely ignorant of coast life that they would ask us, for instance, what the horns of a seal were like. And when we happened to arrive with some walrus meat on our sledges which we had brought up with us, they forbade us to cut it up, as they did not know what it was. Their mode of life is the most primitive that is known to exist, and everything seems to indicate that they are themselves a remainder of the aboriginal Eskimo. Their religion, too, is of a pronounced inland character, very different from that of the coast tribes. In particular, it is free from the complicated system of tabu which prevails on the coast.

Nevertheless, it was soon apparent that they had many traditional features in common with the Greenland Eskimo. I wrote down a number of their folk tales, fifty-two in all, and of these no fewer than thirty were identical with tales known in Greenland.

Our conclusions, then, are as follows:

The original Eskimo culture must have been of an exclusively inland type, that of a people dwelling by lake and stream. In course of time, either led by the reindeer in their wanderings, or driven out by hostile Indian tribes, these aboriginal Eskimo moved down to the shores of the Arctic, and their implements were then adapted to meet the needs of the sea and ice, as we find them in the remains of ancient Eskimo culture on

the coast. The reindeer then, moving parallel with the shores of Hudson Bay, appear to have led them to the region between Coronation Gulf and Boothia Peninsula. From here again they moved on further, westward to Alaska and eastward into Greenland. But the broad belt of tundra west of Hudson Bay barred the passage of one large group, that we have called the Caribou Eskimo. These lived on in the interior, and it is among them that the culture of the aboriginal Eskimo has been preserved.

All this is entirely in accordance with the view first advanced by the late Professor Steensby of Copenhagen. It has been our privilege to furnish the proof of his theory by observations on the spot.

Later on, a new form of Eskimo culture grew up on the shore of Bering Strait, likewise in accordance with Steensby's theories. And here the methods of hunting at sea, especially hunting the whale and walrus from skin boats, or umiaks, flourished to a remarkable extent. From here, in the neighbourhood of Alaska again, a further migration took place westward to Siberia and eastward, through the North-West Passage, Hudson Bay, Baffin Island and Labrador, right across to Greenland. It is the remains of this culture which we find in all the permanent winter dwellings along the coast.

Finally, in comparatively recent times, a new migration has taken place from the interior down to the coasts. The Eskimo who settled here are those we now find, and it is they who have effaced the Alaskan type of culture in the region round Hudson Bay.

The North-West Passage.

It was, as I have said, a principal object of the expedition to get into touch with as many of the Eskimo tribes as possible. And this was the reason why I chose the North-West Passage for my journey home, travelling by dog sledge. I may say that this is the first time the journey has been accomplished in this fashion.

This region, inaccessible as it is, had nevertheless been pretty well explored and charted by previous expeditions along the coast. English explorers, in particular, have made many journeys here. I was therefore able to disregard this part of the work, and devote myself entirely to the study of the Eskimo tribes. Many of these tribes are almost, if not entirely, unknown, as far as any scientific description is concerned.

Throughout the whole of this long journey, from Hudson Bay to the Kent Peninsula, lasting from March to November, we had continual difficulties with the natives. They live in such a state of isolation that any stranger is regarded as an enemy. It is hard to imagine a corner of the world in which people had never heard of the late war. But this was the case with the natives here. They themselves never went in to the trading stations, but obtained such of the white men's goods as they could by barter from neighbouring tribes. In many places we found them

still using bows and arrows. At Bellot Strait, for instance, north of Boothia, there was not a gun to be seen.

As a general rule, the natives turned out fully armed to meet us, and we had to halt the sledge a good way outside their villages. I then went forward myself, unarmed, to assure them that we came as friends. The position was not altogether free from anxiety at times, but we had to trust them, and our confidence was never abused. It was, of course, an advantage that no difficulty existed in the matter of language. We found ourselves understood wherever we went. Generally, in the course of a couple of hours we had got on friendly terms, and I was able to set to work making notes of their customs, religious traditions, and folklore generally.

All the Eskimo of the North-West Passage are known by the name of Kitdlinermiut among the Hudson Bay natives, and bore a very bad reputation there. We were assured that we should never get through alive. In some cases, too, on arriving at a settlement, only the women came out to receive us, the men being hidden behind the huts ready to fall upon us at the first sign of danger. But we always managed to establish a good understanding with them after a while. The great thing is to approach them with fearless confidence at the start.

It is a remarkable thing about these people that their acts are often widely at variance with their natural qualities. And if we were to judge them only by the things they do, we should often find them brutal and barbarous in the extreme. To take a single instance: It is a custom among these tribes to kill off nearly all girl children as soon as they are born, unless they have been asked in marriage beforehand. The girls are sacrificed in favour of boys, who of course will grow up into hunters able to provide food for themselves and others. As a result, there is often a dearth of women in their communities, and this again leads to quarrels among the men, often with fatal results. We might well suppose that a custom so brutal in itself could only make for brutality generally. But, as a matter of fact, we find in the everyday life of these people frequent instances of the greatest heroism and self-sacrifice. Their songs, again, are full of a gentleness and melancholy quite unlike the harshness that appears on the surface to those who do not know them.

We find, for instance, a mother who has herself killed seven of her children at birth. Yet, when her grown-up son dies, she feels the loss so deeply that she is quite literally unable to survive it. It happened in the winter, and she went out on to a frozen lake, calmly cut a hole in the ice, and clambered down under it to drown.

Or take another case. It is not uncommon for aged persons, who feel themselves a burden on the rest, to commit suicide by hanging. Often, too, their relatives will help. A young man who had himself assisted at the hanging of his father, lost his mother some time after, and was so distressed that he did not care to live. He stripped to the skin, and,

going out into the snow, lay down to freeze to death. At a temperature of 50 degrees below zero it would not take long.

Another of these natives, who had murdered two white men in cold blood, was taken by the police and carried off to the nearest station to be hanged. As soon as his father learned that the white men were sending his son on the last long journey, he determined that the boy should not find himself alone on the other side. He made three attempts at suicide before he was finally able to fulfil the duty he felt he owed to his son.

And for my own part, I should like to say that I have never met with greater hospitality, or more unselfish helpfulness, than among these "brutal and barbarous" people. They were always ready to give of what they had, without a question, without a thought, of what they might get in return.

My principal task was to collect material throwing light on the spiritual culture of the Eskimo. And I have brought back with me thirty notebooks, full of material dealing with their life and customs and methods of hunting, as well as their folk tales and songs. The Eskimo are among the most poetical people in the world, and much given to the making and singing of songs.

I was able to procure material for monographs on the so-called Netsiliks between Bellot Strait and Adelaide Peninsula, the Utkuhighalingmiut on the Back's River, and Umingmagtormiut to the east of Bathurst Inlet. I have also a great deal of information from the tribes between Coronation Gulf and Victoria Island, and more or less complete data as to the old hunting traditions and folklore from the original inhabitants of the region between Bailey Island and the Mackenzie Delta. Also from the Alaskan Eskimo, especially the former inhabitants of the inland region between Colville River and Kotzebue Sound. And finally, general information as to the Eskimo in Bering Strait and about East Cape, with descriptions of some particularly characteristic ceremonies on Nunivak Island.

All the Eskimo along the whole of the Arctic shore between the magnetic pole and Baillie Island are, in point of culture, closely related to the inland Eskimo. They are, that is to say, at the same transition stage as the coast tribes round Hudson Bay, which I have already mentioned. But on passing westward from Baillie Island across the Mackenzie Delta and round the north of Alaska to the Bering Strait, we find a type of culture more and more approaching that we know from Greenland. And this is also the case in the Bering Strait.

My visit to the Eskimo of Siberia unfortunately proved a failure. I was arrested by the police authorities of the Russian Soviet as soon as I arrived, and taken to the Governor of the Chukotsk Peninsula, who ordered me to leave the country at once. I had started out from civilization in 1921, and it was then impossible to obtain a passport for Siberia.

There was, indeed, no such thing as a governorship at that place at the time. I therefore contented myself with such official introductions as I could obtain, stating that my objects were of a purely scientific nature. But this particular governor refused to allow me to make scientific studies in his jurisdiction without direct authority from Moscow. I had therefore to leave East Cape again two days after I arrived.

This was the only time throughout the journey when we met with opposition from any Government or its officials. British, Canadian, and American authorities granted us every facility; the Hudson's Bay Company gave us their support. Nobody asked us for passports in Canada; if we met a party of Mounted Police, the only thing they wanted to know was whether they could help us in any way. Even the poor inland Eskimo, who took us for enemies at first, made us welcome when they saw we meant no harm, sharing their food with us, and turning out all hands in a snowstorm to help us build a hut. We met with kindliness and helpfulness all through except in Soviet Russia.

By that time, however, I had already seen a good deal of the East Cape natives, the farthest outpost of the Eskimo to the west. And I was able to see that the culture of the Siberian Eskimo corresponded exactly to that I had already met with in Alaska.

The journey through North Canada and Alaska amounted to something like 16,000 kilometres, and was accomplished without a single mishap. I found no difficulty anywhere in the matter of language. At Point Barrow, for instance, the most northerly settlement in Alaska, I gave a lecture to an audience of three hundred Eskimo, on the subject of their kinsmen in the distant regions to the east. And they followed my account without the slightest difficulty.

I began by pointing out how the work of Arctic exploration and the study of the Eskimo have always gone hand in hand. And I mentioned that these countries, England, America, and Denmark, have all had their share in the work, both in Greenland and Arctic America. We work in the same field; and when one man's work comes to an end, another takes up the task, basing his further endeavours on the results of those who went before him. The work is always going on, and the progress of science is advanced by the sense of fellowship among those engaged in it. Now and again a man is called upon not merely to take up the work, but to pay the last honours to his forerunners. It fell to my lot, in the course of my last journey, to perform this duty for two members of the ill-fated Franklin Expedition.

It happened in this way. Among the Eskimo at Pelly Bay I obtained a great deal of information concerning previous explorers, the record of their meeting with this tribe having been preserved in that remarkable way the Eskimo have of handing down the tradition of notable events. I learned, among other things, that all the iron then in use among this tribe, in the form of knives, harpoon-heads, arrow-heads and the like,

came from the ship of a white man that had wintered in Felix Harbour and Victoria Harbour a hundred years before. This, of course, was Ross.

My informants were an old man named Iggiararsuk and his wife. I sounded them further, to see whether they could tell me anything about the Franklin Expedition. And here, too, I found that they were well informed. It appeared that Iggiararsuk's father, Mangaq, had actually met some of Franklin's party, and had given the following account to his son :

" We were out hunting seal. Suddenly we heard the shouting of strange men from the land [this was King William Island]. We ran up to them, and saw that they were white men. They were thin, with sunken cheeks, like starving men. We took them to our tent and gave them seal meat and blubber. We would gladly have helped them, but could not understand their speech. They pointed toward the south, towards the Great Fish River, and made signs by which we understood that they had formerly been many comrades together, but only few were left. Afterwards, at another time, we found their ship. It was out in the ice between King William Island and Victoria Land. Many dead men were on the ship, and we could see that they had died of a sickness. Also there was found a boat, with six dead men ; there was food enough, and it seemed that these also had died of a sickness."

Iggiararsuk then gave me the position of four different spots where lay the bones of Franklin's men. I succeeded in locating two of these places, one in King William Island, the other on the shore of Starvation Cove, in the Adelaide Peninsula.

We found the bodies. With them were still some fragments of clothing, enough to show that they were actually white men. A cairn was then built above the bodies as they lay, and the two flags—their own and ours—hoisted at half mast. We were glad to feel, as they perhaps might have been glad to feel, that the work for which they gave their lives is still going on.

Note on the spelling of names.

In general the decisions of the Geographic Board of Canada have been followed in this paper : Baffin Land becomes Baffin Island ; Hudson's Bay becomes Hudson Bay (except in the name of the Company) ; and the S apostrophe *is omitted whenever possible. But it does not seem possible to follow the Board in omitting the apostrophe while preserving the* s, *as in Backs River and Ponds Inlet, which they write for Back's River and Pond's Inlet.*—ED. *G.J.*

Before the paper the PRESIDENT (Dr. D. G. HOGARTH) said : We open a new session to-night with a new President, but fortunately it has not been for many years past the custom in this Society for the new President to read himself in with any kind of formal address. I think we have sufficiently marked the opening of the new session by the invitation which we have extended to, and which has been very kindly accepted by, Dr. Knud Rasmussen, one of

the greater names among contemporary geographical explorers. I will not detain you, because he has a good deal to tell you to-night and the story is extraordinarily interesting. It is the story of his fifth and latest expedition to study the Eskimo people, which entailed a great journey along the whole north coast of North America and, in fact, ended up in Siberia. I think Dr. Knud Rasmussen is the only member of this Society, perhaps he is the only scientific geographer in the world, who has held an evening meeting of this kind among the Eskimo themselves. I believe he addressed three hundred Eskimo at Point Barrow—as far north and remote as anything in the world could be—about the other Eskimo who lived too far away to be within their knowledge. I believe some part of what he told those gentlemen on that occasion he will tell us to-night. As I say, he has a good deal to tell besides many interesting pictures to show. Therefore I will not keep you from him, but call upon him at once to tell you his story.

Dr. Knud Rasmussen then read the paper printed above, and a discussion followed.

The PRESIDENT: We have the honour of having with us this evening Count Ahlefeldt Laurvig, the Danish Minister, and I will ask him to say a few words with regard to the remarkable tale that has been told by his compatriot.

Count AHLEFELDT LAURVIG (Danish Minister): As the Danish representative in this country it is a pleasant duty to me to tender to the Royal Geographical Society my sincere thanks for the hospitality extended on so many occasions to Danish scientists, and this evening to my friend Dr. Knud Rasmussen. It has been a most interesting lecture. As a Dane I feel proud of the administration of our far-away colony, Greenland. The government of that country is certainly not carried out with the object of financial gain to the Danish exchequer. On the contrary, it is a fatherly administration of the natives, who, under Danish rule, have prospered and multiplied. The relations between Great Britain and tiny Denmark have always been of the most cordial nature, and I am happy to say that these have extended to colonial matters. All we Danes were proud when we learned that Mr. Rasmussen had been called to Canada to give advice as to the administration of the Canadian Eskimo. I conclude this short speech with a vote of thanks, on behalf of Denmark, to the Royal Geographical Society.

The PRESIDENT: Mr. Charles V. Sale, Governor of the Hudson's Bay Company, has a knowledge of the country; perhaps he would like to add a few words.

Mr. CHARLES V. SALE (Governor, Hudson's Bay Company): I cannot, as the President said, claim any personal knowledge of the country, to which Dr. Rasmussen has been and of which he has given us such an interesting description; but on behalf of the Hudson's Bay Company, of which I have the honour to be the Governor, I thank Dr. Rasmussen for the kind manner in which he has expressed appreciation of the assistance given to him during the course of his great adventure, and for the tribute which he has paid to the officers and servants of the Company. When Dr. Rasmussen first approached us, early in 1921, we suggested that he should postpone his journey, as our posts, owing to war-time conditions, could not be relied upon for more than a limited supply of necessities, such as flour, tea, and sugar; but nothing could deter or dismay Dr. Rasmussen, who set forth on his long journey with the simple assurance of bare necessities with the courage and bravery which characterize all whose interests take them to the Arctic Regions. Happily our post managers

were eventually able to supply not only the actual necessities but almost everything required by the expedition. As an indication of the difficulties of which Dr. Rasmussen makes so little, I may mention that on one occasion, having fallen short of ammunition, a native was sent by him to the nearest Hudson's Bay Company post, and that four months elapsed before the man's return.

Dr. Rasmussen has also referred to the difficult conditions under which the Eskimo exists, leading, in the more remote regions, to the killing of infants and the suicide of the aged. So far as I know, these practices do not prevail to any extent within the range of our trading posts, of which we have established over twenty new ones within the last fifteen years in the Eskimo country, whilst preparation has been made for still further establishments in the future. Each post represents a link in a chain which will eventually become a chain of security for the Eskimo in every part of the Canadian Arctic. We are taking supplies of food, clothing, medicine, etc., within a steadily widening range and in increasing quantities, and in this way we are materially improving the chances and conditions of life in those desolate regions. I may also add that we are investigating the possibility of securing and, with the aid of science, of preserving supplies of local food for the Eskimo, in order to ensure still further against the shortage of natural food supplies and the rigours of the climate. In conclusion, I wish to congratulate Dr. Rasmussen upon a safe return from his long journey and to thank him for the very interesting record to which we have listened with so much pleasure.

Mr. G. M. GATHORNE-HARDY: I feel considerable diffidence in saying anything after the extraordinarily interesting lecture to which we have listened this evening and in the presence of such a distinguished authority on the question of the Eskimo as Dr. Rasmussen. I am in the fullest agreement with him in all that he said about the excellence of the work done by his compatriots in the study of the Eskimo in Greenland, and when I was making my superficial amateurish investigations into Eskimo remains and things of that kind in Labrador I often wished that the attention of some of those with whose work in this field I was acquainted, through reading that interesting periodical *Meddelelser om Grönland*, could be directed also to that part of the world. I am sure there are in Labrador—in spite of the fact that the Eskimo there have now been for long a very civilized body—problems connected with the past of the Eskimo and of kindred tribes, on which I wish to say a word, which would fully deserve the study of people so well up in the subject as Danish investigators.

The Eskimo remains of the past that I saw in Labrador were all of the type that Dr. Rasmussen has described, belonging to the coastal type, not the inland, the remains consisting of houses of turf and stone mixed, which are to be found all along the coast, and they certainly go back to the time when people were using stone weapons, for one found numerous remains of stone weapons and places where they had been making them and where the ground was covered with flakes.

Apparently earlier than that civilization, but at the same tine overlapping it, there was on the islands along the coast a mysterious race called by the Eskimo *Tunnit*, who have long been extinct, though the remains of the houses they built are still to be seen on the islands. They are built of stone used dry, apparently with no turf, because the stone fits close together in a different way from that used in the ordinary Eskimo houses. And although these Tunnit appear to have used stone weapons, so far as one could ascertain they were different from those ordinarily found upon the coast. Wherever you find

legends, accounts, and traditions of the Tunnit, which is over a large area because they were eventually driven north to Baffin Island, the Eskimo appear always to have regarded them not as Eskimo but as something quite different, which suggests they could not have been merely a different sort of Eskimo tribe. They must have been something very different indeed, although in many points their civilization was connected with the same kind of life, or much the same.

But two points of particular interest emerge in regard to these people from the traditions connected with them: the first is that the traditions always say that these people had no boats but were forced to steal from the Eskimo. Of course they must originally have had boats if they lived on islands, and if they were of the ordinary Eskimo type one sees no reason why, having lost their boats, they should not have been able to replace them. The second point is that these people wore their clothes made of sealskin with the blubber on, which I take it means they were unable to dress the skins properly, as Eskimo would. The Eskimo now use the word "Tunnit" to describe a very dirty person, and they must have been the very last word in squalor if they impressed the heathen Eskimo with the idea that they were dirty.

The interesting point, then, about this race, which certainly existed, because one sees remains of their buildings, is that while living a primitive existence it was apparently so lacking in the characteristic primitive culture of the other Eskimo. They were so few in numbers that the Eskimo were easily able to drive them out and eventually get rid of them. They were, according to tradition, larger than the Eskimo, but from the fact that they were so few in number one finds it difficult to regard them as having been indigenous inhabitants of the place. Altogether, I think in this point there is a very interesting problem. I do not know how it fits into Dr. Rasmussen's line of study, but I suggest that he and his learned compatriots might devote some of their attention to the question of the problems which arise on the Labrador coast.

Captain H. P. DOUGLAS, R.N. (Hydrographer of the Navy): I wish to say a few words, not only as a member of the Royal Geographical Society but as a naval officer and Hydrographer, to let Dr. Rasmussen know how much we appreciate the good brotherhood, the tenderness, and the great kindness he has shown, which led him to pay a tribute to some of the ill-fated members of the Franklin Expedition. I can assure him that the British Navy appreciate it most heartily, and it makes one more bond between the two countries, Great Britain and Denmark, which I am sure will never be severed.

The PRESIDENT: Would any one else care to say anything or to ask a question? If not, I would only express, in your name what I am sure you will endorse, namely, our great gratitude to Dr. Rasmussen for having given us such an extraordinarily interesting account, with its intensely poignant postscript. You will find, when you read his paper in the *Journal*, that a great deal has been omitted to-night. I listened most particularly for some reference to the remarkable passage in which he takes up the case of the Eskimo who have been accused of peculiar brutality because at one time there had prevailed among them the custom of exposing female children. Dr. Rasmussen has a remarkable passage in defence of the Eskimo in that connection, and it is perfectly justifiable to defend the practice. It is merely a question of food supply, and almost all people whose food is difficult to obtain have practised that, to us, perfectly inhuman custom. There is no more remarkable fact in the history of the world than that the Prophet Muhammad, in the seventh century,

managed to get the custom dropped in Arabia. It had prevailed there because food was as difficult to obtain as in the Arctic, and the temptation to keep the number of mouths down to those which could feed themselves and provide food for the community, rather than have too many who would have to be fed, was as strong.

I think what interested me most in Dr. Rasmussen's paper and in what he has said to-night is that very remarkable instance of a settled people (if the theory on which he is going is right) breaking up and becoming nomadic and completely changing its food—if, I say, that theory is well founded, that the original Eskimo were settled people living in houses and an inland people living upon mammalian food and game. He did not actually give a reason. The only reason that we know in history for anything similar applies to cases of warfare and pressure of one people upon another driving them out of their settlements. So far as I know, there is hardly a single case of that in which recollections of the settled life have not remained, and to which, as soon as opportunity has occurred, the exiles have not returned. The Eskimo case appears to be an instance of a settled people adopting nomadic conditions apparently, more or less, for ever. Is there any other reason than some failure of the game supply, which I suppose is the most natural reason to suggest in this particular case? Did the game become either scarce or inaccessible, and was it on that account that these people came down to the sea where they found food more persistent in one place, more easy to get, and more certain, and therefore they adopted the life which we usually associate with Eskimo people at the present day? But I rather gather from what Mr. Gathorne-Hardy said that he is not quite convinced of the truth of that proposition, and if Dr. Rasmussen, who is the greatest living authority upon the Eskimo, has anything further to say I am sure this audience would be glad to hear it. I call upon him now, with your permission, to say anything more that he would care to say before the meeting closes.

Dr. KNUD RASMUSSEN: I want to thank you all most heartily for your welcome this evening, and for your kindly interest in the Expedition whose work I tried to put before you. All the scientific results of the Expedition will be published as soon as possible in English, and then I hope you will be able to find the answer to such questions as I have not been able to deal with to-night, especially the last. I should like, however, to say a word in conclusion. I have in the course of my lecture mentioned the names of several explorers in whose footsteps we trod. I should add two more. At the commencement of our expedition we passed up through Hudson Bay, and far beyond the Melville Peninsula lies the little island bearing the name of Jens Munk, so named after that Jens Munk who sailed from Denmark three hundred years ago to search for the North-West Passage. He landed at Churchill River, and that river is still marked on the eighteenth-century maps as "La Rivière Danoise." The last part of our journey took us through Alaska into Bering Strait, which is named after Vitus Bering, the Danish explorer who discovered Alaska nearly two hundred years ago. Between these two extreme points lies what may well be called the classical ground of Arctic exploration: the field where so many brave lives have been lost and so many great names won. It fell to our lot on this last expedition to travel through this battle-zone of science of those two great nations who gave us access to the ground, and I should like to regard our own contributions to the cause of science as a promise of further co-operation between us. I hope that we and those who come after us may again work together with the same great end in view.

NOTES ON THE ETHNOLOGY OF KHURASAN

W. Ivanov

TWO principal factors were continually at work in the evolution of the Persian ethnical type. The first was the periodic admixture of races of different stocks during the numerous wars and invasions, frequently combined with the depopulation and devastation of large areas. The second, perhaps the more powerful of the two, was the unceasing migration of the population due to economic causes. Probably very few corners in Persia can claim to be ancient from the point of view of their village population. In the greater part of the country, although the towns and the principal villages may be very old, the population often consists of new settlers who migrated there from some other province.

Many changes have taken place here since the tenth to thirteenth centuries, the period at which several important works on the geography of this part of Asia were written, containing some information about the distribution of the Persian element at that time. Since that period in the ancient seat of the Persians many of the most fertile and flourishing areas have become populated with different races, chiefly Turkish. Such are the provinces of Samarqand, Bukhara, Merv, Khiva, Northern Khurasan, and a considerable portion of Fars, Hamadan, Azerbaijan. Only a small number of Persians live on the Upper Oxus, and in Persia itself they form nowadays but a small part of the population, occupying, with the exception of the towns, the most sterile and arid land.

There is very little chance under these conditions to find the more or less pure Persian type. Often the Persian-speaking population has much foreign admixture, whilst non-Persian people, like Turks from Hamadan and Azerbaijan, not rarely preserve a comparatively pure Iranian type.* For the purposes of anthropological research, therefore, it is not an easy matter to define the idea of a " Persian." Before the physical type of this people can be properly described, with its standard peculiarities, the best way to act perhaps will be to regard, conventionally, every individual as Persian, in the strict sense, whose mother tongue is one of the Persian dialects, and who belongs neither to a non-Persian tribe nor exhibits any clear physical signs of his connection with some other race.

Considering only the population of the last-described class in present-day Persia, with its present political boundaries, one can see considerable difference between the western and the eastern halves of the country, taking as the dividing line the desert track stretching from the south-

* In the villages around Hamadan one can often see all phases of transition between the Persian and Turkish peasants. First the former becomes bilingual, and then loses gradually the use of his original tongue. The physical type does not change so rapidly, the Turks living there having much Iranian blood in their veins.

eastern corner of the Caspian to the hills of Persian Baluchistan. In Western Persia a great number of minor dialects are spoken, which all form degrees of transition between the ordinary classical Persian and idioms of the Luro-Kurdish group. Probably as a result of numberless migrations the original population has split into a number of small isolated communities; these frequently form separate hamlets that speak a dialect of their own. Anthropologically there is no uniformity in the type, every local group having its own peculiarities. But in spite of considerable variety these Western Persians show a marked difference from the Eastern Persian type. Among the latter the Khurasanis, with small local variations, are remarkably uniform in comparison with the Western Persians; only in Seistan, in the remote south, a once flourishing population lives which speaks a slightly different dialect.

So far as the present state of ethnical facts and the linguistics of Persia are known, Khurasan appears as the largest Persian-speaking province of the country, in which the dialect is not only uniform, but which also stands in the closest relation to the classical Persian that has produced the great Persian literature. It seems, therefore, as if the student of Persian ethnology has first to turn towards Khurasan in his search for a pure Iranian type. It is remarkable how little has been done in the way of ethnological survey in this country. Many years ago a Russian traveller, N. Khanikov, promised to write of the ethnology of Khurasan, at the end of his important work, 'Mémoire sur la partie méridionale de l'Asie Centrale,' 1861. But afterwards he found that the question could not be dealt with unless he were to take the whole of Persia for the subject of his research.* It seems however that this statement, although undoubtedly correct, overlooked the fact that Khurasan presents a considerable difference in the character of its Persian and non-Persian population from other provinces, and that in its history there were periods in which Eastern Iran frequently lived a life that was different from that of the western provinces. Therefore there are sufficient reasons to think that a preliminary reconnaissance of Khurasan, taken in regard to its linguistical and ethnical peculiarities, separately from the other provinces of Persia, would not constitute a methodological blunder.

Having spent several years in Khurasan, during which time I paid special attention to these matters, I offer here some notes on the distribution of the Persians in the province, together with information concerning the other races which live by their side. These notes deal with Khurasan within its present administrative and economic limits, and are based on personal observations, or, more rarely, on inquiries from the natives of the districts which could not be visited.†

* See his 'Mémoire sur l'éthnographie de la Perse' (Paris, 1866), p. 2.

† The Persian authorities have never undertaken a census of the population. The financial institutions that are concerned with the collection of taxes have usually lists

I

In the absence of material concerning the physical description of the population, the importance of the language spoken to-day is very great. The dialect that one hears in Khurasan belongs to what is—according to the terminology proposed by the late O. Mann *—styled the South-Western group.† It presents few essential departures from the colloquial Persian except for its phonology, that shows more signs of the linguistical "wear and tear" than even the most vulgar forms of the "bazari." ‡ It has its local peculiarities, and can be roughly divided into three main groups: the Northern, of Juwain, Sabzawar, and Nishapur; the Central, of Turshiz and Gunabad; and the Southern, of Qain, Tun, and Birjand. The discrepancies are, however, very small; they cannot be regarded as forming real "sub-dialects." Besides, these have a great number of transition forms between them, as well as between each of them and the ordinary "bazari."

This remarkable uniformity of the language may be indeed due to the uniformity of the original dialect from which the present Khurasani has sprung. But a study of the local Persian conditions suggests quite a different explanation. In the world everywhere, as they do in Persia, the towns exercise enormous influence on the adjacent villages, especially with regard to the language. Khurasan in the course of about one thousand years was just the province of Persia in which the largest and the most commercial towns were situated. Is it not natural to expect that the influence of the "bazari" during a long period considerably affected the local idioms, while the endless migrations of the village

of villages only, in which nothing is shown beyond the approximate estimation of the producing capacity of every hamlet. These estimations are only revised every fifty years or so. The same is the case with the offices which deal with the recruiting of soldiers, where only the people whose ancestors have been granted land for service are counted. It is remarkable what little information on this interesting subject is gathered from the descriptions of travellers. All pay very little attention to ethnical differences and still less to the dialect of the peoples with which they have to deal, simply styling them all as "Persians." In England, Col. Sir C. E. Yate is the only modern author of exception; his 'Khurasan and Sistan' is here frequently referred to.

* O. Mann, 'Kurdisch-Persische Forschungen,' 1909, I. Die Tajik Mundarten der provinz Fars, Preface. A. Christensen also follows this terminology in his article on the dialect of Semnan.

† The Persian-speaking population of Fars is so small and uses so many local idioms that it is hardly justified in being called the chief representative of the group. It would be better to call this group the Eastern-Persian. The aggregated population of Khurasan, Herat, and Seistan is much greater than that of Fars; the difference between these Eastern dialects are much smaller than is the case of many of the Western sub-dialects, including the Papuni and Somghuni that O. Mann describes in his book, which are spoken in the insignificant hamlets of Fars.

‡ This is, I believe, rather a reliable linguistical standard, because the language of the cities, or primarily of the bazars, is quite uniform, and local expressions and phonetical rules, although often found in it, do not alter its nature essentially. Its deviations from the language of the educated are chiefly due to the introduction of slang, which is based on the "phonetical economy" used so often in Persian.

folk reduced the original differences to a minimum? Most probably these two causes were working concurrently.

The actual distribution of the Persians over the province may be approximately described in the following way. Beginning from the north, one finds an occasional Persian population in the districts of Isfarain and Jajarm, and sometimes in places along the Russian frontier.* All these settlers are new-comers who appeared after the Turkoman raids were stopped by the Russian occupation of Transcaspia, and are emigrants from different parts of Persia, speaking only the usual "bazari."

Further south some comparatively old Persian populations live in the villages of the northern slopes of the Jaghatai range in the district of Juwain.† On the other side of the range, in the districts of Sabzawar ‡ and Nishapur,§ also in Turshiz‖ and Turbat-i-Haidari, and partly in Sar-i-Jam and Jam, the Persians occupy villages chiefly in the hills, or in the vicinity of cities. The ancient districts of Tus, Ab-i-ward, Sarakhs, and partly of Sar-i-Jam, which have been depopulated so often, contain very few Persians except for the Meshed district. The latter in regard to its ethnical composition is a real museum of local tribes and races.¶ Settlers from very different provinces live here, who speak only the "bazari."

In all the northern districts, including Sabzawar and Nishapur, the Persians form a small minority. In many localities the majority of the people are Turks, Kurds, Baluchis, and Barbaris. The latter especially are very actively supplanting the villagers in the districts of Meshed, Nishapur, and Quchan.

* It is the same in Sangkhast, Jajarm (cf. Yate, *op. cit.*, p. 388); also in modern hamlets which have sprung up lately in the Isfarain and Quchan districts amongst a non-Persian population.

† Although living in close touch with Turks and Kurds, the peasants of Juwain preserve the archaic Khurasani better than their countrymen from other districts. The villages are numerous and are much scattered in the hills.

‡ Sabzawar villages are not numerous and are situated chiefly north-west from the town in the direction of Khusrugird. A number of them are scattered on the southern slopes of the Jaghatai range, or at the foot, in the valley. Few of them are found on the southern side of the salt river, Kol-i-shur: Pasangar, Qaizur, Daulatabad, 'Aliabad, are the largest. A few are also found in the ravine of the Kuh-i-Mish range.

§ The Persian population of the present Nishapur is very small. It lives round the present city and on the ruins of the ancient one, the *débris* of ancient buildings being always regarded in Persia as making the most fertile soil. Some of these villages are populated by Jamshidi immigrants (who came from north of Herat) since the last Perso-Afghan War. They call themselves Baluchis and speak the ordinary Persian language. In religion they are Ismailis (vil. Firdaus). Further east they live as half nomads (Kushk, etc.).

‖ In the district of Turshiz, which is famous for its fertility and magnificent fruits, the population is thickest on the southern slopes of the hills which separate it from the districts of Sabzawar and Nishapur. The track is narrow and the desert begins a few miles south, where there are only a few hamlets and occasional camps.

¶ The majority are of quite modern origin; many are still in the process of building. The most ancient places, like the ruins of Tus, strangely enough, are populated chiefly with new-comers, viz. Barbaris.

Many villages in these districts are probably ancient places, but the population does not show long occupation in their present homes. In the gorges of the Binalud chain there are many old and large villages, like Dizbad, Qasimabad, etc., in which the inhabitants preserve their sectarian religion of Ismailism,* though their tongue is but that of the bazars of Meshed. On the other hand, there are some villages on the plain which still preserve an archaic idiom, like Danah and Musha (near Qadamgah), which are close to the ancient great road to Khurasan, amidst Turkish and Jamahidi settlements.

The districts below, towards the south, contain a very thin Persian population, namely those of the Bajistan, Bushruyeh, Arishk, and Kakhk districts on the west, and Khaf, Bakharz, Jam and Taibad on the east. These few Persians live chiefly on the arid hills and in the few oases in the desert.

The districts of Gunabad,† Nimbuluk, Qain, Tun and Birjand are probably the oldest in Khurasan in regard to their rustic population. Not long ago these places usually had their principal connections with Herat, not with Western Persia.‡

Along the Afghan frontier, as well as further south towards Seistan and Kirman, the peasants differ considerably from the Khurasani type in their appearance and in the dialect, which probably is connected with the ancient idiom of Seistan. It is spoken in Neh and in Nehband, and apparently forms the basis of the tongue of the Sunnikhaneh, a series of arid valleys stretching along the present Afghan frontier.

In all the districts of Khurasan the Persians live in villages often separated by long distances one from the other. Amongst them, as settled peasants, are living people of different races and tribes, nomads or half-nomads, who will be mentioned later.

But before taking up the description of the non-Persian ethnic

* Cf. W. Ivanov, "Ismailitica," *Memoirs of the Asiatic Society of Bengal*, vol. **8**, 1922, pp. 52–55.

† Before the present town of Turbat-i-Haidari acquired its importance owing to the change of the commercial roads (after separation from the province of Herat), Jumain, the capital of Gunabad, the central district of Khurasan, had the greatest consequence. Gunabad has had frequent changes in its population, some of the villages have a Turkish admixture, and not rarely a Gunabadi differs in physical type from any other Khurasani. The chief village at present is Baidukht, near Jumain, but the majority of ancient towns are in ruins owing to the continual raids of brigands.

‡ These ancient districts not long ago were quite isolated from the other parts of Persia and were governed by independent rulers; they retain many archaic customs and practices. In the hills remnants of old feudal families are still found (like that of Furq); till quite recently merchants used to bring their wares to sell once a year, in the most primitive way; after having sold these, they went in a caravan at a particular season to fetch again more goods. The large villages, which are also called towns, such as Khusf, Khur, Dorokhsh, etc., have a long history, which begins from the tenth century. In the hills are many mazars, or places of worship, always connected with some natural phenomenon, stones of peculiar shape, etc. Probably these places are of great antiquity. The toponomy of the district is interesting, and may reveal much concerning the ethnic history of Birjand.

elements in Khurasan, it seems necessary to make a few summary remarks on the principal peculiarities of the Persian population of this province.

The Khurasan peasant is generally tall and well built, having a brachycephalic type of head, with thick hair and a fair complexion. He is hard-built and very enduring. The facial angle is very high, though it hardly ever attains that point of beauty, not rarely seen in Western Persia, the face with regular and minutely cut features resembling the ancient Greek sculptures.*

The mental development of an average Khurasani peasant is not very high, and literary people are exceptions among them. But for an inhabitant of the desert he is remarkably intellectual, far more so than the Turks, Kurds, Baluchis, Arabs, Gypsies, etc., who also live in the same districts. His wit, clear and practical idea of life, remarkable scarcity of superstition, absence of fanaticism, etc., are the greater the farther he lives from the cities. Family life is based on sound patriarchal principles; temporary marriages, polygamy, etc., are very rarely found in rustic Persia. A village is usually regarded as one large family. Additions to it from without may only come by way of intermarriage. In the case of some calamity and drought the village as a whole generally migrates; disintegration occurs only in the case of emigration, on the part of individual members of the community, to the cities.

It would be necessary to write a large book if the village life should be described in detail. Here it will suffice only to touch on the most essential question, namely that of the power of the Persian peasant's "ethnical resistance." Cases of intermarriage with nomads are rare; much more common are connections with Turkish or Kurdish settlers in the north, especially with the Mongol Barbaris. Gypsies and Arabs are regarded as unmarriageable; so are Timuris and Baluchis, being mostly Sunnites. Pilgrimages to Meshed and other holy places, or wanderings of the camelmen, lead to the spreading of disease, which, coupled with opium smoking, rapidly destroys the health of a village. The most important cause of degeneration however consists in the poverty of the peasant, which he is unable to overcome.

In spite of his brilliant intellectual qualities, which no other race in Asia can rival, the Persian is remarkably helpless in everything which is connected with industrial activity. There are no arts and crafts in the local villages. Almost everything must be bought in the bazar, except very rough and primitive cotton and woollen homespuns.†

* It is remarkable that very few traces of small-pox are seen or cases of sore eyes and signs of venereal disease. Child mortality is very great, and in spite of the peasant woman having many children, large families are rare. Until quite recently the degeneration of the local peasant was slow. The improvement of communications and the temporary presence of troops rapidly changed events. It was striking to notice the many changes that have occurred in seven years, viz. from 1913 to 1920.

† Cotton cloth (karbas) is woven in many villages, and is usually brought into towns to dye with indigo, making a blue or a green-blue shade. The woollen cloth

Domestic utensils, agricultural implements,* harness and clothing must all be purchased. These he has to pay for from the miserable products of his fields, which are cultivated by very primitive methods. Some unobservant travellers have spread the general European idea that the Persians are experts in irrigation. This is pure fiction, and is one of the many misrepresentations of Eastern life. In reality, any other nation would probably evolve better methods if it were forced to depend on irrigation. The usual *karizes* and the distribution of water are exceedingly wasteful, expensive, and ineffective. This is not a result of laziness, but shows real incapacity and the strong conservative spirit.

The style of the village life is practically the same as appears in the occasional references that are found scattered in various hagiological works and other literary productions that were written several centuries ago. The usual form of village organization is that in which a "landed property," or, as the Persians call it, "water," belongs to the owner of the *kariz* which irrigates it. The peasant forms a special contract in which everything is carefully foreseen. The owner gets his rent in kind, in the form of a fixed portion of the crops, some difference being observed in the event of the owner supplying the seeds and not the cultivator. Other forms of lease are those granted by the governor, when the water is the property of the state, or by some official in charge of the funds of some shrine. Occasionally, and in very old villages, peasants are the collective owners of the water. Some of them are comparatively wealthy, although this does not change their style of life, because usually they prefer to hide their silver in some safe place, rather than invest it in some economic improvement.

II

The history of the gradual permeation of the different races into Khurasan in the Muhammadan period is not yet clear. Most probably it will come to light when the knowledge of Persian history increases. At present it seems that the earliest non-Persians were Arabs who in the first three centuries of Muhammadanism came as conquerors, while later, in the eleventh century, came the Turks who belonged to different tribes and who moved in the south-western direction. Very few Arabs

is of the coarsest quality, and makes corn-bags, rugs, and saddle-bags. The woollen cloth for human wear is produced only in the villages which practise the art. The most famous place to manufacture "barak," or "barrak" (from *barra*, lamb), is Bushruyeh, between Bajistan and Tabas, from which place the cloth is brought to all the cities of Khurasan for sale. Every length of this fabric is in a single piece, and it only makes one "aba" or cloak as worn by merchants, priests, etc. Threads and ropes are also manufactured by the peasants.

* All the cooking utensils are made of copper, last for generations, and are rarely tinned. Earthenware jugs, and a few other kinds of vessels, are bought in the bazars. The modern well-to-do village buys glass, lamps, and chinaware, which mostly serve as a decoration instead of being used for utility. All agricultural implements are produced in the towns, but gypsies sometimes make spades, axes, etc.

now remain; there are only a few degenerate and impoverished families in the south of the province, constituting a starving nomad tribe.

The Turks are still numerous, and there are many invaders of quite recent origin, such as the Kurds, who came here in the sixteenth and seventeenth centuries, the Timuris and the Baluchis, who extended their wanderings further and further north. The latest immigrants are Mongols, the so-called Barbaris, or Hazara, who are still continuing to come in numbers. It will be better to deal with each tribe separately.

Kurds.—It is difficult to find if any Kurdish tribes were living in Khurasan before the beginning of the sixteenth century. In the surnames of many different celebrities who are natives of this province the term "Kurt" is often met with. Even a dynasty of this name ruled south of Herat in the hill districts (643–791 A.H., or 1245–1389 A.D.). Kurd and Kurt are undoubtedly the same as they are to-day; but if there had been some Kurdish people in Khurasan, they must have mixed with Persians. When under the Safawides the necessity arose of defending the northern frontier of Khurasan against the inroads of the powerful Uzbegs and Turkomans, local means were not sufficient, and the Shahs tried to institute a measure similar to that of the Cossacks in Russia, *i.e.* they settled some warlike and virile people in the threatened area. Therefore some tribes of Kurds from Kurdistan proper were transferred as early as the middle of the sixteenth century. In the beginning of the seventeenth century a new party had arrived; some of these tribes still live there, like the Kaiwanlu, the Shadillu, etc. Some more of them arrived later on in the eighteenth century, under Nadir (like the 'Amarlu). At present there is no connection with the West, and the Khurasani Kurds are gradually undergoing "Turkomanization."

With regard to the racial and tribal names, it may be observed that they are utterly unreliable for the purpose of establishing any conclusions to ethnical connections. The tribe is usually called after the surname of the chief or of the place of settlement, and very soon the whole of the tribe, to which several sub-divisions belong, becomes named after the section which was most prominent and important among them. In practice there is nothing more difficult than obtaining exact information of the name of a tribe with its sub-divisions. In Khurasan the difficulty is still greater because there are no distinct sub-dialects, and the idiom of the Kurds appears practically uniform. Many sub-sections are closely connected with the Turks, and experience real difficulty in deciding whether they are of Kurdish or Turkish nationality.

These continual changes of names make it difficult to draw up a systematic table of sub-division. Of the four tribes which are traditionally regarded as the original, namely 'Amarlu, Za'faranlu, Shadillu and Kaiwanlu, the first and last appear to-day as small tribes, while the other two are mostly Turkish-speaking and have ceased to be regarded as Kurds. The following list gives an approximate idea as to the present principal

sub-divisions of the Kurdish-speaking tribes; they are mentioned in order from north to south, and according to the area which they inhabit:

1. Melanlu, in Qushkhaneh, the northern part of the districts of Isfarain, Juwain, and the extreme north of Nishapur.
2. Bajgiranlu, a small sub-tribe, living near Bajgiran.
3. Aghazlu, near Aghach and along the frontier.
4. Hiwalanlu, near Quchan, and in Darreh Gaz.
5. Qasmanlu, near Nawukh, Dizawun, etc.
6. Shadillu, in Bujnurd, etc., mostly speaking Turkish only.
7. Za'faranlu, in Shirwan, have now lost their former importance; very few speak Kurdish.
8. Kuranlu, north of Quchan.*
9. Mashkanlu, near Mashkan, in the district of Quchan.
10. Burji, *ibid.*, near Radqan.
11. Kaiwanlu, *ibid.*, in Juwain and in the northern parts of the Nishapur district.
12. Mazhdakanlu, in northern part of Nishapur and the Quchan districts.

All these tribes represent forms of transition between pure nomads and the ordinary peasant. Many of them are half-nomads, *i.e.* they cultivate fields in the summer and are nomads in the winter, when they shift to some warmer district. It is specific that the transition from the nomadic to the settled life is very gradual, and that it is going on in every tribe.

Some other tribes consist chiefly of nomads, such as the following:

13. Rashanlu, in Khakistar, Lain, near Kaakhka.
14. Briwanlu, near Kaakhka, and in the summer in Kelat.
15. Hafshalanlu, Darreh Gaz in the winter and Quchan valley in the summer.
16. Badiwanlu, in the same places.
17. Jafkanlu, in the winter at Chamakalur and in the summer at Kuh-i-Daulat.†
18. Karamanlu, in the northern parts of the Nishapur districts.
19. Waranlu, a small tribe in the same place.
20. Tupkanlu, in the district of Juwain, partly in Nishapur; in the winter they migrate to the Dasht-i-Taqi.‡
21. 'Amarlu, north-west from Nishapur, in and around the village of Marushk (also called Marush).

* Their name resembles the Gurans of Kurdistan proper, and the connection is quite probable.

† These may be connected with a western Kurdish tribe of Jafs, who are very numerous along the Mesopotamian frontier.

‡ Their migrations extend over a very long distance, taking weeks for a journey with their live-stock. It is remarkable that their passage is never accompanied with any accident or robbery.

This division probably will not last long. The great famine and drought of 1916–1917 have greatly reduced the numbers of flocks, and the typhus and other epidemics have rendered many powerful tribes insignificant.

It is noticeable that a Khurasani Kurd differs in his physical structure from his kinsmen in the West, *i.e.* in the real Kurdistan, exactly as the Persian peasant of Khurasan differs from a western. The Khurasani Kurds are much taller and stronger, but their features are not so finely cut, and the facial angle is not as high as the one seen in the west. The Khurasani Kurds resemble Lurs more than the western Kurds in their physical type, although fair-haired individuals are much rarer amongst them.* They are a comparatively healthy race except in the vicinity of cities, where disease and opium smoking are frequent.

There is a great deal of unity between all these different tribes, and the feuds which are so common in Kurdistan proper apparently do not exist. Like all nomads, Kurds possess a greater national feeling than the settled Persians. There are apparently no great differences between the local idioms, and intercourse between tribes is very common; even intermarriage is very frequent.

The language of the Khurasani Kurds belongs to the so-called Northern or the real Kurdish family, and is connected with the dialect of the Mukris more than with any other known idiom. It has, however, several discrepancies from that original tongue. The Khurasani Kurdish is greatly influenced by the laws of the Khurasani Persian phonology. The vocabulary varies very much in different localities, and is either replete with Persian terms in the south, or with Turkish in the north. Many Kurdish families are bilingual, especially in the north, where they often speak better Turkish than Kurdish.

Baluchis.—This is another important tribe of Iranian origin living in Khurasan. They are nomads. Very rarely isolated families become settled, but in one or two generations they lose all connection with the Baluchis and become assimilated with the Persians. The Baluchis who extend their wanderings far to the north, live in the districts of Juwain, Nishapur, Turshiz, etc., and have already lost their original language. Further south their idiom resembles the original tongue, *i.e.* the Makrani dialect of Baluchi. Very little exact information about their language and folk-lore is available at present.

Physically Baluchis differ considerably from Persians and Kurds. They are usually much smaller, their features are not so regular, and their facial angle is often very sharp. They are an unsightly, lazy, apathetic people, although they possess much predatory spirit. Their seasonal

* The impression concerning this may not be correct, because the adults dye their hair with henna and always keep the head covered. But it seems that in Kurdistan proper one sees more numerous fair-haired children than in Khurasan; in the West they may be mistaken for Europeans.

migrations bring grave anxiety to the Persian peasant.* They are extremely poor usually, and the last famine much reduced their number. The majority of them are Sunnis, and therefore avoid dealing with the Persians. They intermarry with the Timuris only, who are also Sunnites. The only industry which still exists among them is carpet weaving.

Their division into tribes is uncertain, chiefly because they are extremely scattered, more so even than the Kurds. The tribes represented in Khurasan proper may be divided as follows :

1. Khanzai, in the districts of Sabzawar and Turshiz.
2. Rashkanlu, in the district of Sarakhs.
3. Kurd, in Sarakhs and further south along the Afghan frontier.
4. 'Ali-Mirzai, apparently a sub-division of the preceding tribe.
5. Shahuzai, also along the Afghan frontier.
6. Janbegi, in the districts of Turbat, Gunabad, and Khaf.
7. Bahluli, chiefly south-west of Birjend.

Of all these divisions the most important is Janbegi. Almost all the carpets of Baluchi origin in the Meshed bazars are woven by them.

Timuris.—These nomads, having an occasional admixture with the Jamshidis, are closely connected with the Baluchis, so that they are often called by the same name. In Khurasan they live close to the Afghan frontier, and are represented by comparatively few tribes only. Many of them still preserve the original ties with the bulk of their tribe in Afghanistan, south of Herat. Their principal grazing-grounds lie around Kariz, in the Taibad district, but many are scattered in Bakharz, Khaf, Jam, and even in Sarakhs. Their language is Persian, with some peculiarities which have not yet been studied. The majority are Sunnites, although Shi'ism makes good progress amongst them.† They intermarry with Baluchis only. The principal tribes are : ‡

1. Zuri, in Taibad (Ahmad-sara, Tangalshur, etc.), and Sarakhs.
2. Buruti, in the same districts.
3. Murdashahi, in Taibad.
4. Haudani, also in Taibad.
5. Sangshuli, near Fariman, Shahan, and other villages of Sar-i-Jam.
6. Ya'qubshahi, near Mazangan and in Sarakhs.
7. Mirzadusti, also near Mazangan and in Sarakhs.
8. Wakhiri, in the district of Turbat.

* Sometimes enterprising divisions, like the Bahlulis in the Birjand area, undertake operations on a larger scale ; frequently the town itself becomes filled with the rumour of an impending raid of the Baluchis. On learning that one of the villages in the district has been attacked, the peasants hide everything and go up to the hills, keeping a close watch behind rocks. The Birjandis shut themselves up in a fortified enclosure commanding the town.

† Especially are there many among the Burutis. These changes cannot be attributed to any missionary activity on the part of the Shi'a divines, and are entirely due to the growing indifference on religious matters.

‡ Formerly the most powerful tribe was the Chakana. It has now scattered, and its members have joined other divisions.

Turks.—After the Persians apparently the oldest population of Khurasan are the different Turkish tribes which inhabit its northern extremity. In all probability they are remnants of many successive "waves" of the invaders from Turkistan which have passed since the tenth century; there have been also many local migrations. There are many dialects spoken at present, that are distinct from the Turkmani and from the Azerbaijani Turkish. It is remarkable that in a single village in some cases one half speaks a different dialect from the other half. Khafr is such a village, some 16 miles east of Nishapur, at the entrance to the Jagharq pass. It is regrettable that Turkologists have so far entirely neglected Persia, in which the Turkish population, on account of its isolation, preserves more variety in their linguistics than anywhere.

There are comparatively few Turkish nomads in Khurasan. Usually their villages are flourishing and show considerable prosperity. There are also half-nomads, especially where large flocks are kept.

As everywhere, the Turks in Khurasan present more signs of degeneration than Kurds or Persian peasants. Physically they are inferior to both. The majority have a microcephalic head-form, are middle sized, having sharp facial angles and irregular features. Mentally they are also inferior to Kurds and Persians, being not so intelligent. They are quarrelsome, irascible and nervous, while the majority of the local brigands and criminals are supplied by them. Opium smoking and disease are very common amongst them.

The dissection into subdivisions is unreliable, many families claiming an improbable ancient descent from noble houses. It may appear as if Khurasan is inhabited only by emigrants from Syria and Western countries. There are Bayatis in the northern part of the Nishapur district, Bayandars, etc., who claim kinship with the famous tribes of Azerbaijan. The most numerous are the Bughiris in Bam, Safiabad, Juwain, and Isfarain. Another tribe of great size is the Qarailis or Garilis, who live in all the northern districts. The most southern tribe, that of the Qarais, who inhabit a part of the district of Turbat-i-Haidari and Gunabad, have become at present almost entirely assimilated with Persians.

Barbaris.—These are apparently another tribe of a Mongolian origin; they are emigrants from Afghanistan, from Firuzkuh, on the Kashan river, with the administrative centre Qal'a-i-Nau.* In European

* Till quite recently they were almost entirely independent under their own ruler (cf. W. Barthold, 'A Historical and Geographical Review of Iran' (St. Petersburg, 1903), p. 34). They claim to be the descendants of Mongols who settled there in the thirteenth century. Historians often refer to the Nikudaris, the tribe of the Prince Nikudar (*ibid.*, p. 55). In the time of Babur some hill tribes still retained their original Mongol idiom, west of Kabul (Baber-Nameh, ed. N. Ilminski, 1857, p. 161). The Barbaris whom one sees in Persia apparently speak Persian only, and this loss of their original tongue, combined with complete integrity of the ethnical type, is a remarkable

literature they are called the Hezara. By them this name is apparently never used, but is applied to the Iranian tribes Timuris and Jamshidis.* Their migrations began long ago, and they have gradually ousted Persians and Turks from the eastern extremity of the Hezar-masjid range. At present they are shifting further and further westwards, chiefly into the northern part of the district of Nishapur. They are divided into several sub-divisions, in which almost every one has settled and nomad members:

1. Uruzghani, near Chehar Deh, in the Hazar-Masjid range.
2. Jaghuri, in the same hills, and in Sar-i-Jam.
3. Bisud
4. Daizangi } all east in Sar-i-Jam.
5. Daikundi
6. Laljangi, east Sar-i-Jam and in Sarakhs.

The districts of Meshed and Quchan have many villages with a Barbari population, especially in the lands belonging to the Shrine of Imam Riza at Meshed. They agree to work on terms which are more profitable to the landlords, who prefer, therefore, to employ them rather than the Persians.† These settlers belong to different tribes, and their distribution is quite accidental.

In their physical type they are pure Mongols, recalling the Kalmucks, the Qirghiz, and other people of Central Asia. They are a short, strongly built people, having a comparatively fair complexion which is only seen on the rare occasions when they wash. The faces are typically Mongolian, whilst the beards are thin and coarse. Their language is a jargon of Persian, and there are no traces of their original Mongolian tongue. All of them are fanatical Shi'ites, and therefore intermarry with Persians and Turks. Almost all of them are nobles from high families, three-quarters of them are Saiyids, or descendants of 'Ali, while others descend from Alexander the Great. They tell a great many ludicrous tales in this connection. Being accustomed to live in extreme filth and in particularly hard conditions, they take easily to a wandering life, but they can also work hard. Often they conduct small campaigns against their nomad neighbours, sometimes with success.

There is grave danger that the Persian population of northern Khurasan will be finally supplanted by these new-comers, or that they will be absorbed by them. A cross-bred Barbari and Persian inherits chiefly the vices, not the virtues, of both parents. Persian intellectual brilliancy is the first thing to be lost. Those half-Barbaris whom I have seen produced an impression of the dull kind of Turk.

phenomenon. Probably they are the remnants of the aboriginal hill folk of the Hindukush and Himalayas, who for a long time lived closely in touch with Persian civilization.

* An isolated group of these real Hezaras, who can only be distinguished with difficulty from the Timuris, are living in the east of Sar-i-Jam and around the village of Karat; they are Sunnis.

† Cf. also C. Yate, *op. cit.*, p. 138.

Arabs and Jews.—The Semitic race has very few representatives in Khurasan. Jews as everywhere are townsfolk here, and at present are only to be found in Meshed. Nothing is left of the large Jewish communities who lived in the cities of Khurasan in the early periods. Only in Meshed itself there are several so-called Jadid families, the descendants of the Jews who were converted by force to Islam in 1839. Although officially regarded as Muhammadans, they continue to hold their ancient rites and observances. Some old-fashioned families, I was told, still preserve the peculiar dialect they once had (like the Jews of Isfahan, Kashan, and other places).*

The Arabs chiefly live as nomads in the southern borders of the province in the districts of Birjand and in the desert along the high-road Nehband–Khabis. Very few families are living in Sarakhs, more are living in villages near Kelat-i-Nadiri and also towards the western Russian frontier, in Nardin, Qotlish, etc. All these settlements are due to some accidental cause, and the emigrants become rapidly assimilated with the local population.

Most probably in earlier periods they were more numerous and important in the south. In the districts of Qain and Birjand there are many villages of which the population is only Saiyid. To-day, although they are the purest type of Persian, they are probably descendants of local Arab settlers.

In the district of Birjand the Arabs live in the so-called 'Arabkhaneh, some 40 to 50 miles south of that city. They are now extremely impoverished, and many of them come into the town to work as coolies. The property of the Arab consists in flocks; occasionally carpets of low quality are woven and sold in the local market, in which they command a very low price.

Their physical type has not preserved anything resembling a real Arab, and a member of the tribe can always pass for a Persian. Traces of degeneration are great, and the Arabs look a very feeble folk. The language is a horrid jargon, in which the vocabulary is almost completely Persian, but the remnant of grammar is of Arab origin. Songs and even lullabies are composed in Persian. Real Arabic is absolutely unintelligible to them. Many of them believe it to be impossible to compose poetry in that tongue.

Gypsies.—What Europeans usually identify as gypsies of the Western world appear here in the form of a wandering folk, scattered all over the

* Some details on the different Jewish-Persian dialects may be found in W. Geiger's article in his 'Grundriss der Iranischen Philologie,' vol. 1, 2, pp. 408–412; cf. also C. Salemann, "Judeo-Persica, I. Chudaidat, ein judisch-bucharisches Gedicht," *Mémoires de l'Academie Imperiale de Science de Russe*, VII. series, vol. 42, No. 14; V. Miller's 'Materials for the Study of the Jewish-Tat Dialect' (in Russian), St. Petersburg, 1892; T. Nöldeke, "Judenpersisch," *Z.D.M.G.*, vol. 51, 1897, pp. 669 *sq.* Specimens of Jewish-Persian poems are also given in V. Zhukovsky's 'Materials for the Study of Persian Dialects,' as in vol. 2, pp. 390–394, etc.

province and living in extraordinary poverty. They are styled by the various names of Qirishmal, Jat, Kozengi, etc., and the real ethnical affinities of these people will probably never be traced. Their physical type varies considerably in different localities. It has nothing peculiar which would enable one to recognize a gypsy at once. Although gypsies form a strictly endogamous community, one very often finds features in their physiognomies belonging to other races. The majority of them can scarcely be distinguished from Persian peasants.

Intellectually gypsies are exceptionally dull and have an undeveloped mind. Even the most primitive higher ideas are entirely strange to their mentality. As a rule the majority of them confine their wanderings to definite areas, and use the idiom of the race they move among. But they also possess their own jargon, which they use in business dealings when they do not wish to be understood by strangers. This jargon is probably a secret code of thieves and not the remnants of the " original " gypsy vocabulary. It is extant perhaps from times immemorial, and is universal in all parts of the Muhammadan world.*

It is characteristic that this folk has its quarters in different towns, where it is looked upon as being merely craftsmen or merchants. In the towns of Nishapur and Sabzawar in the north are found special gypsy quarters, while in the south their winter centre is Sarbisheh, south of Birjand on the Seistan road. In fact, the migrations of these people had better be called the movements of a wandering tradesman. They visit places where there is work for them. Persian peasants are often helpless without the aid of a gypsy, who does the work of a blacksmith, carpenter, sieve-weaver, etc. The usual Gypsy occupations of the West—fortune-telling, music, dealing in horses, and theft—are not practised here.

As we have seen, the ethnical milieu in Khurasan is very complex, and the Persians found there are in a very unfavourable position. This province has entirely lost the place it once held as the centre of Persian civilization, and the peasants of more or less pure Persian stock are gradually pushed towards the outskirts of the Central Desert in the direction of the west and south. The comparative integrity of the small scattered communities of the Persian peasant can continue only as long as the great difference between the nomad and the settled style of life remains, with the difficulty of communication and in the absence of commerce. Even nowadays, in the vicinity of big towns the state of things is quite different. Then the local differences of peasants and nomads vanish while the population rapidly adopts the more or less uniform colour of the " surburban " civilization and uses the bazari language.

* More details on the Gypsy style of life in Khurasan and their language may be found in my contributions to *J.A.S.B.*, vol. 10, 1914, pp. 439–455; vol. 16, 1920, pp. 281–291; vol. 18, 1922, pp. 375–383.

This state of things in Khurasan is not only a peculiarity of the province, but is similar in many other parts of Persia. It is interesting to observe that in the East three-quarters of the area which was originally inhabited by Persians has changed its population during the last thousand years, whilst in the West, near the Tigris, the limits of the Persian habitat have not undergone any considerable alteration. Nowadays here also the Persians are a vanishing race, as being gradually replaced by Luro-Kurdish and Turkish races. It is difficult to anticipate how long the process of the gradual extinction of the Persian race and the Persian dialects will be. With the gradual spread of European civilization and the improvement of communications they may vanish with extraordinary rapidity. Before it is too late it is, therefore, the most urgent duty of the Oriental students to save as much as is possible of their linguistic and ethnological material.

I am much indebted to Mrs. C. de Beauvoir Stocks for her valuable help with my English in this paper.

FLORIS BALTHASAR, DUTCH MAP-MAKER, AND HIS SONS

Edward Lynam

FLORIS BALTHASAR and his sons rank among the best Dutch map-makers of a period when the Netherlands were supplying the world with maps. Little has been written about them, even in Holland, though their work is mainly of Dutch interest. It seems worth while to give a brief account of it here—an account drawn to a great extent from a valuable paper by J. T. Bodel-Nijenhuis in the *Verslagen* of the *Koninklijk Nederlandsche Instituut van Wetenschappen*, 1845.

Though probably a native of Flanders, Balthasar is first found at Delft, where he was a burger and goldsmith in 1589. It was apparently by accident that he came to make maps. He accompanied the army of Prince Maurice in the relief of Bommel in 1599, and made himself useful by drawing, and afterwards engraving, a map of the town, its fortifications and surroundings. For this he was well paid by the States-General. During the next fourteen years, either for profit or adventure, he accompanied the Dutch armies in most of their campaigns against the Spaniards, and produced many military maps. He seems to have been especially skilful as a surveyor, and on some of his maps calls himself "Gezwore Landtmeeter" or "Sworn Surveyor." In the intervals of peace he surveyed and mapped the country around Delft, making maps which are distinctly superior to those of Peter Kaerius or De Keere, though De Keere is much better known to English writers on cartography. He died in 1616, having produced the following maps, all of which are now rare.

1. 1600. Siege of Bommel.—2. 1600. Country from Philippine to Nieuwpoort, to illustrate Prince Maurice's march on Ostend. Plan of Dunkirk inset. Reissued with slight changes by H. Hondius, 1616. [In British Museum.]—3, 4. 1600. A large and a small map-plan of the Battle of Nieuwpoort. Very rare. Both appear much reduced in Blaeu's first atlas.—5. 1602. Siege of Grave. The assault of the Spaniards inset. Two sheets folio.—6. 1602. Gravenwaert. First published in Orlers' and Van Haesten's *Nassauschen Lauren Crans*, 1610, pp. 187–191, and later in Orlers' *Genéalogie et Lauriers de Nassau*.—7. 1603–4. Ostend. Large scale. Latin verse by Grotius.—8. 1604. Dutch water expedition to Cadzant to relieve Ostend.—9. 1606. The Bommelwaert and part of Betuwe.—10. 1607. Jacob van Heemskerck's expedition to Gibraltar. Exceedingly rare.—11. 1610. Siege of Gulick. Fourteen copies printed on white satin.—12. 1609. Delftland. Ten sh. fol., coloured, large scale.—13. 1609. Schieland. Fifteen sh. fol. (of which two are text). Coloured, large scale.—14. 1610–15. Rijnland. Twenty-two sh. fol., coloured, large scale.—15. 1614. Rees and Wesel. Very rare.—16. 1615. The Rhine from Wesel to Tholhuis.—Doubtful. F. Muller believed that an anonymous map of the English and Dutch attack on Cadiz in 1596, which H. Hondius published, might have been engraved by Balthasar (*De Nederlandsche Geschiedenis in Platen*. I. p. 125). There is no evidence for that.

Much of the engraving of Nos. 12, 13, and 14 was done by Balthasar's son, Balthasar Floriszoon. They are his most important maps, and in accuracy of measurement, fineness of engraving, and neatness of colouring they are superior to most contemporary maps. Though printed, these maps were coloured by hand by the Balthasars before they were issued. The surveying, drawing, engraving, and colouring were therefore, apparently, done by the same hands. The result is generally successful, but in places the colours are put on rather too heavily. Balthasar's experience as a goldsmith probably helped him here. The plates of some at least of Balthasar's maps seem to have come into the possession of Henricus Hondius in 1616. Balthasar Floriszoon worked over them later, and Hondius published them, under Floriszoon's name, in various shapes and editions.

Balthasar Floriszoon, who afterwards called himself Balthasar Florenz van (*or* à) Berckenrode, worked on a more ambitious scale than his father and before his death in 1645 obtained the title of "Ordinaris Landtmeeter ende Caertemaecker van de Generaliteijt." He was a very fine engraver, but also possessed his father's martial tastes and made considerable sums from his military maps. Of his twenty-seven maps the following are the most important:

1. [1620.] Map of all Holland and Friesland. Eleven sm. fol. sh., two half-fol. sheets, and four strips bearing title. Rare. New ed. by N. Visscher 1651.—2. 1625. Amsterdam. Nine large fol. sh. Very

fine map. Philippus Molevliet's name also on title. Amstelland inset.—3. 1626. Rotterdam. In collaboration with Evert Simonszoon Hamersvelt.—4. 1628. Bishopric of Utrecht. Drawn B. F. à Berckenrode, engraved Hamersvelt, published Hondius. [British Museum.]—5. 1629. County of Holland. Reduced from No. 1. Engraved S. Rogiers, published H. Hondius. [Brit. Mus.]—6. 1629. Rijnland and Amstelland. Rijnland reduced from his father's map. Amstelland larger scale than on No. 2. [Brit. Mus.]—7. 1629. Delftland and Schieland. Reduced from his father's map. Islands Voorne, Goeree, Overflakkee and Ysselmonde added from No. 1. [Brit. Mus.]—8. 1629. The Doordrecht Islands. Based on No. 1, with river courses altered. [Brit. Mus.]—9. 1629. Duchy of Gelderland. Drawn by B. F. à Berckenrode, engraved Abr. Goes. [Brit. Mus.] The last six, Nos. 4 to 9, are single sheet, folio.—10. 1631[?]. Siege of 's Hertogenbosch. Several hands contributed, but engraving done by S. Savri and B. F. à Berckenrode. Six sh. (of which three text). Very fine work, the best of its time.—11. 1643. Map or view of Queen Henrietta of England's departure from Scheveningen. Engraving not very good.—12. 1631–2. Westfriesland. One sh. fol. Without author's name. Closely resembles No. 1. Second edition bears name of J. Janssonius, who took over many of Hondius' plates. Appears in Blaeu's 1635 atlas, unacknowledged.

Of these maps, Nos. 4 to 9, with some alterations in detail, appear in H. Hondius' edition of Mercator's Atlas, Amsterdam, 1630 [Brit. Mus.], as also in editions of 1633 and 1639 in the Collection of the R.G.S.; and No. 4 and the 1651 edition of No. 5 in a collection of maps, *Les Pais Bas et Allemagne* [1630–90], also in the British Museum. The same maps were, besides, the unacknowledged originals of some of Jansson's, the elder Visscher's, J. A. Colom's and Blaeu's maps; even the great 1656 map of Holland and Westfriesland by N. Piscatore [Visscher] was based on Balthasar Floriszoon's work. Maps by the Balthasars were eagerly collected by J. T. Bodel-Nijenhuis, and copies of all but the most rare of them can be seen in his Collection in the University Library at Leiden.

Maps by two other sons of Floris Balthasar are known. Neither of these, however, seems to have pursued the profession of map-maker regularly, and very little is known about them. Cornelis Floriszoon, who afterwards called himself Cornelis Floris van Berckenrode, made —1. 1629. Yeselstroom from Arnhem to below Deventer, with part of Veluwe. Published by C. [*alias* N.] Visscher, Amsterdam.—2. 1629. Siege of 's Hertogenbosch. One sh. fol. The British Museum has a copy, entitled *La Siège de Bolduc* [Bois-le-Duc]. Frans Floriszoon produced—1. Map of the rivers Maes and Wael.—2. The Battle of Emmerich. Bodel-Nijenhuis had not seen the last two maps, nor does F. Muller mention them.

By 1660 the work of the Balthasars was becoming overshadowed

by the great maps of Blaeu and Visscher and by the fine engraving of Vingboons. But they deserve honour from Holland, for they made the first really good maps of her polders and fens, and they witnessed and illustrated the battles which made her renowned.

THE RIDDLE OF HANNIBAL'S PASS

Where Hannibal passed.— Arthur Rivers Bonus. London: Methuen & Co. 1925. 7½ × 5, pp. 96. *Twelve Illustrations and a Map.* 7*s.* 6*d. net.*

Annibale L'Uomo: La Traversata delle Alpi e le prime campagne d'Italia fino al Trasimeno secondo gli antichi e la verità storica.— Ing. T. Montanari. Rovigo: 1900–1. A spese dell' autore. 8 × 4½, pp. 780. *Maps.* (To be obtained of the author, Via Maggiore 58b, Bologna.)

Miraggio e Realta sulla via d'Annibale per le Alpi.— T. Montanari. Rome: 1925. Pp. 24. Rassegna dell' Esercito Italiano, Fasc. III., IV. 1925.

HERE we have yet another col brought forward as a possible scene of Hannibal's Alpine adventure. Mr. Bonus, like Mr. Torr, insists that the Pass—or one of the Passes—on the Carthaginian route must command a view of the Plain of Piedmont, and this requirement, of course, rules out all the great passes, including the Col de l'Argentière. Mr. Bonus further accepts the authority of the fragment of Varro as establishing the order of the Passes from south to north, thereby limiting his field of search to the upper basin of the Durance and its tributaries, and the part of the main range that stretches from the Argentière to the Mont Genèvre.

The Alpine route he proposes for the Carthaginian host is briefly as follows: From Grenoble over the Col du Lautaret (6800 feet) to Briançon; then up the glen of the Cerveyrette and over the Col de Malrif (9200 feet) to the headwaters of the Guil. Here Hannibal finds the watershed of the Alps still before him in the shape of the Col de Malaure (8400 feet), an obscure gap only a few miles north of Mr. Torr's Col de la Traversette (9680 feet).

A reference to 'The Alpine Guide,' or to the Government maps, will inform inquirers that in this part of the chain there are several practicable depressions of much less elevation than the two passes recently assigned to Hannibal—the Col du Clapier and the Col de la Traversette. On either side of the Mont Genèvre (6083 feet) lie the Col de Bousson (6990 feet) and the Col des Échelles (5774 feet)—the lowest gap in the chain of the Alps west of the Orteler group. It did not, it seems, occur to Mr. Bonus to investigate either of these accesses to Italy. From Abriès, in the Guil valley, he climbed to the Col de Malrif and thence caught a glimpse of the Piedmontese plain over another range some 7 miles to the east. He subsequently visited this farther ridge, the Col de Malaure, a gap in the watershed, and again enjoyed a view of Italy.

On this material Mr. Bonus has constructed an original version of what happened. He suggests that Hannibal enjoyed the view from the Col de Malrif; but owing to bad weather saw nothing from the second pass. He believes that his famous speech was made not on a "promontory" but on a level plot of ground, a few hundred feet below, and on the *western* side of, the Col de Malaure, and was based on what he had previously seen from the Col de Malrif.

It is of course possible that stragglers may have been misled or missed the track—as Livy suggests, but the main lines of the Alpine march were undoubtedly laid down on a preconceived plan. The Alpine steeplechase indicated above is therefore obviously open to serious objections and hardly likely to meet with any general acceptance. But, like most of his predecessors, Mr. Bonus is satisfied that he has succeeded in guessing the eternal riddle. He writes, "Where Hannibal went during those three weeks has for some two thousand years provided matter for varied speculation. This book explains." Does it? We cannot afford space here to go into the argument at any length. Those who may desire to do so, must be referred to Mr. Bonus' own statement of his case.

The local topography is illustrated by some excellent photographs, but the so-called map is a poor diagram.

The ink of the preceding sentences was hardly dry when by a curious coincidence the post brought in from Italy a portly volume in which the secluded and hitherto neglected byways of the Cerveyrette were again put forward as the probable scene of Hannibal's "Ascent of the Alps."

Many years ago my friend Lord Bryce, who took an interest in Hannibal —in what did Bryce not take an interest?—remarked that while England, France, and Germany each possessed a literature dealing with Hannibal and his famous march, the country that might have been expected to show most interest, Italy, had taken comparatively little part in the controversy. The works of Sig. Montanari, now before us, have hitherto escaped notice in this country. Their indefatigable author, it must at once be admitted, has done his best to repair his countrymen's negligence. He has, he alleges, done more; for he claims to have "demolished the whole library" of his foreign predecessors.

To the carrying out of this formidable task he, in 1900, devoted a volume of no fewer than 780 pages, of which 380 are concerned with the Alpine march. Much of his space is occupied by corrections and confutations of his fellow-scribes. He fires away with such zest into the crowd of commentators that in the smoke and heat of the contest the ordinary reader may find himself in some danger of losing grip of the main question.

The starting-point and pivot of Sig. Montanari's argument is that the river Polybius calls the Rhône is the Durance. To support this paradox he is obliged to have recourse to some very bold expedients. For Polybius is at pains to describe the river he calls the Rhône as having its sources above the Adriatic on the northern slope of the Alps and flowing through a deep valley lying between the Alps on the south and Keltic tribes on the north. If the sources are thus placed too far to the east, the mistake makes the identification of the Durance with the river described only the more incredible! Those who can accept it may find it relatively easy to acquiesce in Livy's definite statement that Hannibal went out of his way and marched inland in order to avoid Scipio's army being unceremoniously swept aside; or in Livy's phrase *ad lævam* being converted into *ad dextram*.

Space fails us to examine in any detail Montanari's line of march through the French Alps. He adopts the lower crossing of the Rhône near Tarascon; he finds his "Island" in the district between the Verdun and the Durance. Thence he conducts Hannibal across the latter stream and past Sisteron to the neighbourhood of Gap. He places the first battle among the hills west of Gap, the second in a defile in the valley of the Durance below Briançon. Here his and Mr. Bonus's routes meet, and then travel together, but only

for 7 miles, up the valley of the Cerveyrette. There Montanari turns sharply to the left in order to cross the Col de Bousson to Césanne in the valley of the Dora Riparia. This is obviously a more attractive suggestion than Mr. Bonus's route over two loftier and harder passes. Several points may fairly be made in its favour. It complies with Varro's catalogue in lying south of Pompey's Pass, the Mont Genèvre; it leads directly to Turin, which may be on the site of the stronghold of the Taurini, and was certainly in their country. On the other hand, it shares with the Argentière the drawback of commanding no view of the plains. For it is idle to pretend that a view of the meadows round Césanne (4460 feet) can serve as a panorama of Piedmont. Still, the Col de Bousson may plausibly be put forward as a rival to the Mont Genèvre.

But, alone perhaps among Hannibalian critics, Montanari has not remained faithful to his first love. During the last quarter of a century he has contributed some forty notes, articles, and pamphlets dealing with Hannibal's Alpine march and Italian campaign. From one of the last of these, published in 1925, we learn that he has transferred his devotion to the Col des Échelles. This pass has, it is true, one conspicuous recommendation: that of being the lowest in the Western and Central Alps. But why, the historian may ask, has it no history? Why has it never been traversed by armies or gained any commercial importance? It has been reported to owe its name to its access on one side being by a staircase impassable for mules. But, apparently, this obstacle may be easily circumvented. The map provides a more obvious reason by showing that it leads only from the head of one remote valley to the head of another. For travellers from France to Italy it is a circuitous variation of the much shorter Mont Genèvre.

Sig. Montanari earns our respect by his prodigious industry and his sustained enthusiasm in the pursuit of a solution of this evasive problem. He has, in our opinion, contributed to this end by reaffirming the statement of Livy that Hannibal approached the main chain of the Alps by the valley of the Durance. He has also done well to call attention to the group of exceptionally low cols on both sides of the Mont Genèvre and between it and Monte Viso.

It is amongst these that a possible rival for the Col de l'Argentière may most profitably be looked for. To the claims of the last-named pass Montanari has done singularly less than justice. It remains for a competent critic

"Nullius addictus jurare in verba magistri"

—uncommitted to any particular line of march—to examine impartially, and on the spot, the natural features of the various Durance Passes.

D. W. F.

Mr. Bonus sends the following Note:

I have been favoured with an advance copy of a review of two other publications and of my book 'Where Hannibal Passed,' which scarcely covers the matters dealt with by me. No one reading this review would be likely to realize that the case I put forward is as follows:

(*a*) That Hannibal selected a route which should have got him across the Alps in $5\frac{1}{2}$ days, instead of the 15 actually occupied in transit; a route probably adopted by the earlier Gaulish invasion of Italy (Livy, v. 35); a route certainly adopted by the Romans, once they became acquainted with it; a route described in Ball's (and Coolidge's) 'The Western Alps' as "the most direct route . . . by a comparatively low pass;" a route, that is, most likely to be adopted by a competent general intent on getting an army across the Alps in the shortest possible time.

(*b*) That the passage of the Alps by this route was all but completed when, for reasons easily to be understood, Hannibal was led astray by guides locally engaged. This treachery is expressly mentioned by Livy; and the writings of other classical authors make it clear that Hannibal did go astray.

(*c*) That it was only through being thus misled that the Carthaginian army went anywhere near the Col de Malrif and to the region east of it. Hannibal never had any intention of indulging in what the review describes as this "Alpine steeplechase."

(*d*) That the book contains no guessing of riddles, but a reasoned case built up from the facts of the topography and of the texts, chapter and verse being quoted throughout.

(*e*) That except for a few errors due to lack of knowledge of the ground, Polybius and Livy both understood very well what they were writing about.

REVIEWS

EUROPE

Lundy: its History and Natural History.— Lewis R. W. Loyd. London: Longmans, Green & Co. 1925. 9 × 5½, pp. 248. *Illustrations and Map.* 12*s.* 6*d. net.*

THIS book can leave very little to be said about the rock-girt little island lying in the mouth of the Bristol Channel. The topography, history, and ornithology are very completely dealt with, and there are also entomological and botanical lists. Lundy seems always to have been a surprisingly coveted possession, and has had a considerably more stirring history than its size and inaccessibility would warrant. For a whole century at least it was a hotbed of pirates, who were finally suppressed in the eighteenth century but had a worthy successor in that enterprising knave, Thomas Benson. From bearing a name of evil repute Lundy passed in the nineteenth century to the other extreme and became known as the Kingdom of Heaven—Kingdom, because it seems to be independent of any county, constituency, or diocese, and of Heaven, because the ownership was in the hands of a family of that name. There is a good story of Bishop Bickersteth of Exeter being compelled by a stormy passage to the island to express his belief in the existence of Purgatory. The book is in one respect already out of date, as Lundy, according to reports in the Press, has changed hands since its publication, having been bought by Mr. M. C. Harman for a price stated to be £16,000. There are many fascinating photographs of birds and rocks, among which it is pleasant to find a view of the Great Shutter Rock, the scene of the culminating event in Kingsley's 'Westward Ho!' The map has no altitudes and—a more serious omission—no scale.

J. H. R.

A Tour in Ireland: with General Observations on the present state of that Kingdom made in the years 1776, 1777, and 1778.— Arthur Young. Selected and edited by **Constantia Maxwell, M.A.** Cambridge: University Press. 1925. 7½ × 5, pp. xxii. + 244. *Illustrations and Sketch-map.* 7*s.* 6*d. net.*

Arthur Young's 'Tour in Ireland,' one of the leading authorities on the economic conditions of that country in the late eighteenth century, has, through circumstances explained by the editor, a less general appeal than his other travel books. Since it was compiled from his business-like Minutes, it is

naturally concerned with his absorbing purpose, agricultural progress. In the present selection this characteristic is not so noticeable, though at the same time its value as an economic study is not lessened. Miss Maxwell has carried out her task well and unobtrusively, though some of the notes are rather too much of the nature of general statements. Young describes an Ireland with, in general, an increasing population and growing prosperity. Except from Ulster there was little emigration, and that largely of a seasonal character to Newfoundland. Throughout the country, enlightened landowners were improving their estates, though Young, as an enthusiast, was likely to lay particular emphasis upon their work. His conclusion is that "Ireland since the year 1748 made as great advances as could possibly be expected, perhaps greater than any other country in Europe."

Landeskunde von Skandinavia und Finland. — **Heinrich Kerp.** Bd. I. Physische Geographie. Bd. II. Geographische Kulturkunde. Zweite erweiterte Auflage (Sammlung Göschen). Berlin u. Leipzig: Walter de Gruyter & Co. 1925. 6 × 4. Bd. I, 119 pp.; Bd. II, 137 pp. *Each RM.*1.25.

These two small volumes contain within their modest-looking covers a surprisingly complete and well thought-out account of the region now known as Fennoskandia. This forms a well-marked geographical unit, but for convenience the Danish islands and mainland are also included. We thus get a very good general idea of the shores surrounding the Baltic, with the exception of those which make up the German plain and the former Baltic provinces of Russia.

The first volume is concerned with the physical features of the area and contains an excellent summary of its extent, position, and component parts describing the various conditions, structural, climatic, vegetative, etc., to which its individuality is due. The manner in which each of these is treated is concise but sufficient, except that the geological history is rather too condensed.

In a description of this kind diagrams, no matter how rough, are indispensable; but Figs. 1 and 2 in vol. 1 do not supply this need, as they would be more than replaced by a single visit to any geological museum. When we get to Part II. of the same volume, however, the author really gets into his stride and gives a capital description of features actually observed, thus at once transforming into an actual scene what might otherwise have seemed merely a list of dull topographical details. This method, ideal as regards geography, is pursued throughout the region dealt with, and should appeal to a whole new class of readers, *i.e.* not only students but travellers also. Some subjects in this section are particularly well treated, as, for instance, the formation of corries, and the work of ice generally, a careful distinction being drawn between the appearance and effects of ice-sheets proper and glaciers. The individual features and cultural outlook of each area are faithfully depicted, and stress is laid, not only on the impressions of these which can be carried away by the casual observer, but also on their more intimate relation to the spirit and temper of the people.

Volume 2 deals with the political aspect, the form of culture which has established itself in these northern lands, its connection with and dependence on natural phenomena. We see at once that reciprocal relations between the people and their environment have been simple and direct, and have led in recent years to a rapid increase in the importance and magnitude of the industries. It is especially so in Finland, where the figures revealed by statistics

seem almost incredible. This volume contains also a very brief, but useful, historical summary.

The author may be said to have succeeded in his somewhat ambitious aim, which was to show that these northern lands, although the definite nature of their natural boundaries has served to maintain in each a certain identity, have yet formed a united whole in their far-reaching contribution to that world-force born of Europe and known as Western civilization.

E. G. W.

Beyond the Baltic.— **A. MacCallum Scott.** London: Thornton Butterworth, Ltd. 1925. 9 × 5½, pp. 316. *Sixteen Illustrations and Five Sketch-maps.* 12*s.* 6*d. net.*

Mr. MacCallum Scott spent part of the spring and autumn of 1924 visiting Soviet Russia, Poland, and the Baltic States, and in his latest work has embodied some of his observations. He disclaims any attempt to write either a history or a guide-book. His book is a travel book, he says, an attempt to represent the contour, the colour, the character, of these little-known regions of Europe, and their peoples, against the background of their history and their politics. In this he has succeeded, and he has given us a travel book in the best and truest sense. He is no mere passer-by jotting down in a diary superficial observations and hastily formed judgments, to throw together into a book as soon as he reaches home. He is an experienced traveller, a well-informed man of affairs, a shrewd observer who knows what to look for, so that he is able to see more in a week than a tourist maker of books would see in a month; moreover, he speaks Russian and has the advantage of having known the countries he visited when they were part of Imperial Russia.

He begins by giving a brief but interesting history of the Baltic, which he aptly calls the Mediterranean of the North, for it bred the conquering Gothic races that were destined to transform the history of the world. In Russia he visited first St. Petersburg which, as he rightly observes, is no longer the gateway of Russia, and then Moscow, now the true capital. He likens the Soviet Government to that of the old "John Company," a great capitalist trading organization which monopolizes the export and import trade of the country.

Mr. Scott's comments on Poland and the Baltic States are necessarily somewhat fragmentary, for he covered a great deal of ground. He dismisses the important subject of Agrarian Reform and the expropriation of the large landowners in the Baltic States in a few paragraphs, and in his sketch of post-war events he does not mention the parts played by the adventurer Bermondt and by the Allied Missions. But he does not pretend that his book is comprehensive: such facts as he gives are accurate, his descriptions pleasant reading, and his judgments sound—and none is sounder than his statement that closer union in some form is essential for the Baltic States, if they are to maintain their economic independence. The book is well illustrated, and has a good index, and the five sketch-maps are useful.

O. R.

Social Classes in Post-War Europe.— **Lothrop Stoddard.** London: Charles Scribners' Sons. 1925. 8½ × 5½, pp. 178. 7*s.* 6*d. net.*

Any account of the changes in "class" relationships wrought by the European War must of necessity include references to many matters of interest to the student of human geography—to such points, for example, as the varying effects in different parts of Europe of the partition of the large estates, or what the author calls the "anti-urban bias" of the European Peasantry.

The book deals successively with the question of class changes among

the peasantry, the urban working classes, the middle classes, the intellectuals, and the upper classes of Europe, and aims at giving a general comparative survey of the relationships between them. Since, as the author himself points out, the process of social re-adjustment in Europe is merely beginning, the conditions analysed are essentially temporary, and indeed in some respects have changed materially since the date of publication (June 1925). But as describing in brief the evolution of certain states of society, and comparing the different problems of various parts of the country, it should prove of value. It is of interest, too, as representing an American view, though it is doubtful how far certain conclusions would find credence here. Would it be generally agreed, for instance, that the British Middle Classes' Union "has become a real factor in English political and economic life," or that "In England most of the land" (*i.e.* that provided by the breaking up of the large estates) "has been bought by Capitalist Farmers"?

In treating of the conditions of life of the urban working classes, the author contrasts at some length the symmetrical development of the economic and political phases of the labour movement in Germany with its dualism elsewhere on the Continent and in England; he reaches a depressing conclusion as regards the problems of Europe's industrial life, and considers that "it is doubtful whether she can recover her industrial supremacy" or "whether, on the contrary, Europe has not permanently lost much of her industry to keen, ambitious rivals like America and Japan" (p. 75). B. H.

ASIA

North Manchuria and the Chinese Eastern Railway.— Harbin: Chinese Eastern Railway Printing Office. 1924. Pp. xiv. + 454. *Illustrations and Maps.* 6 *dollars.*

The Economic Bureau of the Chinese Eastern Railway published the first edition of this work in Russian in 1922. Its success led to this revised and enlarged edition in English. Some twenty chapters give a full account of the economic geography of North Manchuria with special reference to the use and value of the Chinese Eastern Railway. A final chapter gives a most interesting account of the history, construction, and working of the railway. The book appears to be a sound guide on problems relating to agriculture, mining, manufactures, and colonization generally. The estimate of the population of North Manchuria (provinces of Heilungkiang or Tsitsihar and Kirin) is nearly 12,000,000, which is considerably above the usual estimate of about 7,000,000. If this is true it means that Northern Manchuria now has a population practically equal to that of Siberia (in its old sense), or Siberia with the Yakutsk republic of to-day. This increase is due to Chinese immigration, and represents a sixfold increase in thirty years. The book, which was printed at Harbin, contains a number of maps, diagrams, and illustrations, and altogether is a valuable compilation on a country of growing importance on which it is not easy to obtain trustworthy information. The freedom from political bias adds not a little to the interest of the book, but the lack of an index is a great disadvantage. R. N. R. B.

Six Years in the Malay Jungle.— **Carveth Wells.** London: William Heinemann, Ltd. 1925. 9 × 6, pp. xiii. + 261. *Illustrations and Two Sketch-maps.* 10*s.* 6*d. net.*

Mr. Carveth Wells went to the Federated Malay States in 1913 and spent six years there surveying railways and roads for the Government. This book is a record of some of his personal experiences; he writes, apparently, primarily

for the American public, which perhaps explains why he feels it necessary to devote four chapters to the familiar journey from London to Penang, and to include in an appendix of thirty pages a collection of general information compiled by the Federated Malay States Government. English readers will wish that he had thought fit to allot this space to his own narrative rather than to details so easily accessible elsewhere. He falls into the common error of using the vernacular to excess, and not infrequently spells Malay words incorrectly or uses them in a wrong sense. This criticism is not irrelevant, for it shows that Mr. Wells is not to be taken too seriously. His statements are sometimes a little loose, and he tends to cheerful exaggeration when he tells us that a dozen different kinds of death lurk on every side when a man is alone in the jungle. But within his limitations he writes engagingly enough. There is no harder country to survey in than the dense forests of Malaya, whose one convenient peculiarity is that the magnetic compass points due north, and there is very little about such work that Mr. Wells does not know ; he tells his story with gusto and good humour, and not the least pleasant part is the praise he has for his coolies, often his only companions for weeks on end. The book is excellently illustrated and has two useful sketch-maps. O. R.

Wanderings in the Middle East.— A. Sloan. London: Hutchinson & Co. 1925. 9½ × 6, pp. 318. *Nineteen Illustrations.* 18*s.*

The author of this book of travel presents us with a varied collection of facts —topographical, historical and religious—bearing upon Modern Palestine and Syria, strung together with a most lively account of her journey. As she states, hers were " very ordinary experiences," but she was at times very fortunate in her travelling companions. The information gathered by the way she here presents in a most interesting form. The difficult political position is dealt with dispassionately and well. A chapter on " The Arabs and their Faith " gives a brief outline of the life and teaching of Muhammad, and one on " The Faith of the Jews " describes some of the outstanding features of orthodox Judaism. Indeed, everywhere the religion of the many sects of Palestine and Syria receives sympathetic description. Petra, Damascus, Baalbec, Palmyra, and Baghdad are all well described. It is natural that the history of Palmyra's great queen should be here told at considerable length.

While the statements are generally correct, a few slips may be noticed. It is not correct to say that the ancient road from Damascus to Capernaum ran " over the double range of Lebanon . . . thousands of feet up and down again." Nor is there any ground for stating that since the time of Naaman the Damascenes have believed that the waters of the Barada prevent leprosy. This would be a singular perversion of the ancient tale of Naaman, and, apart from that, Damascus was for many years before the war one of the centres where lepers were segregated.

The " only tale of adventure " is that of the journey (April 1923—apparently the first on this service) in the cars of the Nairn Transport Company from Damascus to Baghdad and back again—a trip which ran so smoothly as hardly to merit the name of adventure. The writer found that general opinion on the position of Feisal's rule in Baghdad was that he was not welcomed when he came, and that " as we evacuate Baghdad by the southern gate towards Basra, the Turks will enter by the northern gate of the city from Mosul and Kurdistan."

Those who have travelled or intend to travel in the Middle East will enjoy this book, which is further enhanced by some excellent photographs.

It is a serious loss that in a book so full of detailed information there is no index. E. W G. M.

Nature at the Desert's Edge: Studies and Observations in the Baghdad Oasis.— [Major] R. W. G. Hingston, M.C., M.B., I.M.S. London: H. F. & G. Witherby. 1925. 9 × 5½, pp. 299. *Plates and Text Figures.* 15*s. net.*

Major Hingston is well known as the Naturalist to the 1924 Expedition to Mount Everest, where he investigated the habits of spiders and insects at prodigious altitudes in conditions of the greatest discomfort and cold. In 'Nature at the Desert's Edge,' he reveals himself as an equally industrious and observant naturalist in almost exactly opposite circumstances, a torrid region only a few feet above the level of the sea. During a summer spent in an oasis near Baghdad, Dr. Hingston found time to investigate the habits of four species of hunting wasps. The females of these insects deposit their eggs in the body of a cockroach, spider, or other animal, in which they hatch, and the young larva eats its way to maturity; the individuals of a species always choose a similar victim. The hunting, the attack, the poisoning and paralysis of the victim, and the subsequent entombment by the wasp, make most interesting, and often exciting, reading. Other chapters, dealing with moths, spiders and locusts, contain a mass of fascinating observations. The rather too exclamatory manner of writing suggests that the chapters were designed by the author for popular lectures. The volume is illustrated with sketches and photographs. A. F. R. W.

Through Khiva to Golden Samarkand.— Ella R. Christie. London: Seeley, Service & Co. 1925. 9 × 6, pp. 280. *Fifty-three Illustrations.*

This is a book of outstanding interest, not only because of the growing importance of Central Asia in the world's affairs to-day, but because it is filled with information set out in a way that other travellers would do well to copy. Additional value attaches to the work from the fact that very few Western observers have seen Russian Turkistan since the authoress made her journey, before the war. (We must except the great numbers of Austrian prisoners of war who have not given us their experiences in English.)

The most important episode described is the writer's journey to Khiva. She claims to have been the first of her sex from Great Britain to reach that remote state, and it is most unlikely that any other has been there since. Her travels are very pleasantly described, with an emphatically sympathetic and human touch. She has the knack of carrying the unique and characteristic atmosphere of Central Asia into her pages, and she brings her readers into a close appreciation of the home-life of the pre-revolution Russian in Central Asia. The description of her stay with the Kornilovs in Khiva, where Colonel Kornilov was then Resident, is especially welcome, and throws a sidelight on an interesting minor aspect of the Russian Revolution.

It was the loyal Tekke tribesmen of the old Imperial Turkoman Regiment of Horse who, in 1917, rallied to the support of Kornilov and Kaledin against Bolshevik treason. They formed the original nucleus of what afterwards became the Volunteer Armies of Denikin and Wrangel. In those armies many Mussulman communities formed contingents, and few will deny that the fighting tribesmen of that religion constituted the soundest and most loyal elements of those who fought in the civil wars on the side of the loyalists and the Allies. The lesson is one which should not be lost on British statesmen, emphasized, as it has been, by the subsequent attitude of Islam.

Miss Christie pictures everyday life, both of Russian and of Mussulman, very vividly: the descriptions of the existence of the Sarts of the towns are excellent. The many photographs with which the book is illustrated are apposite in character and of first-class technique; but the work deserves a better map. L. V. S. B.

Naar Himalaya en Karakorum.— Ph. C. Visser. Rotterdam: Nijh & Van Ditmar's Uitgevers-Maatschappij. 1923. 11½ × 5½, pp. 154. *Sketch-Maps and Illustrations.*

Bijlage bevattende de wetenschappelijke uitkomsten der Kara-Korum Expeditie 1922.— Ph. C. Visser en Mevrouw J. Visser-Hooft. Rotterdam: Same publishers. 1925. 9 × 6, pp. 96. *Map.*

The huge mountain system of the Karakorum extends from the Pamir over the border of Tibet for a distance equal to that from the Hague to Zürich, and covers an area of 25,000 square miles, more or less, and therefore it is not surprising that, though Mr. Visser reckons up nineteen expeditions to this region, it is still in great part unknown. The part he chose for exploration lies south of the Sasir pass and between the Nubra and Shyok rivers, and has a length of about 68 miles with a maximum breadth of about 34. In 1922 Mr. Visser sailed for India with his wife and two guides, Fr. Lochmatter and Joh. Brantschen, from St. Niklaus in Switzerland, and on reaching Leh collected a caravan of ponies and about twenty men, with which he travelled over the Kardong pass to the Nubra valley. Thence he ascended the Thalam Buti valley to the northern part of the country he had chosen for exploration, the group of mountains adjoining the Murgisthang glacier, which was visited by Neve and Oliver. Here he explored several side streams descending from heavily glaciated valleys, and climbed peaks 20,000 feet high, whence he obtained extensive views of this imposing group. He then turned his attention to the southern group dominated by the lofty Sasir Peak, which he endeavoured to climb, but was unable to reach the highest point. With a small caravan of indifferent men it was difficult to ascend the long rocky and glaciated valleys and camp at heights to which even firewood had to be carried from a considerable distance. He was very successful considering the resources at his disposal, and he and Mrs. Visser have been doing more excellent work in this region during the past summer.

The *Bijlage* contains reports of specialists on the scientific observations of the expedition, on the plants collected by Mrs. Visser, the meteorological records of Mr. Visser, and the rock specimens brought home by him, besides his observations on the physical effect of the climate and elevation on members of the expedition, and other subjects. There is also a sketch-map of the region explored, based on bearings taken from peaks and prominent points of observation. Unfortunately, only two geodetic points were available for orientation, namely, K_2 (Mount Godwin-Austen) and Pk. 29 of the Indian Survey; it is doubtful whether the latter is the Sasir Peak of Mr. Visser, the highest of the group. W. A. T.

In the High Himalayas: Sport and Travel in the Rhotang and Baralacha, with some Notes on the Natural History of that Area.— Hugh Whistler, F.Z.S., Indian (Imperial) Police. London: H. F. & G. Witherby. 1924. 9 × 5½, pp. 223. *Thirty-one Illustrations from Photographs and Outline Map.* 15*s. net.*

Mr. Whistler is a well-known Indian ornithologist and a keen sportsman, who has spent much of his leave in the Himalaya north of Simla. As an

officer of the Imperial Police his knowledge of native custom and languages puts his book on a plane of reliability well above that of the globe-trotter, and though it neither claims nor aims at any complete or scientific treatment of his subject, it may be thoroughly recommended to the general reader. Specialists will cavil at the spelling of some of the place-names, as, for instance, "Humpta," but these are small points—and controversial!

The author clearly brings out the curious mixture of the two races of Lahul, with their different language and religion, and gives a good picture of that remote and sparsely peopled wilderness encircled by the Chandra and Bhaga rivers, which take their ultimate source so close together almost on the summit of the Baralacha Pass. Across this pass we are taken to the Lingti Plains, and later over the Kunzam Pass to Spiti, where, of course, conditions are completely Tibetan. The well-known charms of Kulu are lightly sketched by way of contrast at the end of the volume.

Good notes on the game and other animals and birds are scattered through the book, and the last chapter deals with "Birds by the Wayside." The photographs are well selected, and if not as striking as those we have become accustomed to from other parts of the Himalaya, that is the fault of the region, and not of the artist.

Angkor the Magnificent, the Wonder City of Ancient Cambodia.— H. Churchill Candee. London: H. F. & G. Witherby. 1925. $8\frac{1}{2} \times 5\frac{1}{2}$, pp. xx. + 303. *Seventy-nine Illustrations and one Map.* 20*s. net.*

"Still another book on Angkor!" is the exclamation that comes naturally to one's lips when another popular work on this great ruined capital makes its appearance. Such appearance however is all to the good, for there must still be numberless English readers who have never even heard of the place and who would be puzzled to locate it on the map if they had. The work under review will give them some ideas on the subject; but it makes no pretension to being a scholarly or scientific monograph. In fact, it is to a great extent a travel book, and is freely interspersed with *personalia*, irrelevant incidents, and irresponsible reflections on many matters. For all that, its descriptions are good and its illustrations (though on a rather small scale) are even better.

It seems a pity, but is no doubt inevitable, that amateurs in archæological matters should be so prone to indulge in unproved and improbable theories. So here we are treated to fantastic speculations about *nāgas*, lions, etc., in sculpture, as if these things had sprung straight from the soil of Cambodia, instead of having had a long previous history in India, the Motherland of Cambodian art. Likewise there are quaint errors (*e.g.* that Sita was the monkey wife of Hanuman) and some curious spellings of proper names (*e.g.* "Civa rides abroad on a white bull, Nanda"), to say nothing of inept phrases like "rice paddies" for "paddy-fields," and a good many other eccentricities which are probably in part at least uncorrected misprints. No one who has had to revise proofs himself will be inclined to be unduly severe on that score; and on the whole the book can be recommended as being both readable and informative. On the other hand, some rather uncharitable reflections on French (and, in general, European) administration and policy in the East might well have been omitted. C. O. B.

AFRICA

From Red Sea to Blue Nile.— Rosita Forbes. London: Cassell & Co. 1925. 9½ × 6½, pp. 380. *Illustrations.* 25*s. net.*

To any one who has travelled through Abyssinia with the serious object of research in the domain of geography and the sciences, whose experiences are mostly confined to struggles with caravans, theodolites, and plane-tables, where humorous accidents can only be regarded as nuisances, a book such as 'From Red Sea to Blue Nile' comes as a welcome and amusing relief. The Abyssinian is such a strange combination of opposite qualities that he really deserves to be portrayed by an observant traveller with a sense of humour. In this sense the book under review really may be said to meet a "long-felt want." It is a very vivid and entertaining picture of the Abyssinian at home; and the rather slender organization of her caravan, combined with the tireless activity of the author, produced a small crop of disasters that must have been ideal subjects for her enterprising cinematographer.

Such scenes as those described on p. 173 of a general mix-up in a storm, the encounter with the infuriated villagers on p. 161, and the author defying the instruction of the local governor on p. 300, must certainly have made telling pictures. The photographs in the book are very good, especially those of the rock-cut churches of Lalibala and the castles of Gondar.

The author may be congratulated on her powers of getting through difficulties and obstructions that only those can appreciate who have experienced the ingenuity and persistence which Abyssinians can show in delaying any progress, whether of a traveller across their country or a business man in the region of commerce. In the scriptural language they are fond of employing on such occasions, it can only be described as "digging a pit in their path and laying a net about their feet."

The author is not so happy when she deviates into history. She takes quite seriously the legend of the visit of Queen Maqeda of Ethiopia to King Solomon and the spurious descent of the King of Kings of Ethiopia as a result of that visit, or the equally fabulous abstraction of the Ark from Jerusalem and its deposit in the church at Aksum. The story is given in the 'Kabra Nagast' (the Glory of the Kings), written sometime in the thirteenth century to justify the capture of the throne by the line of Yekun Amlak (1268–1283) through the influence of the Abuna Takla Haymanot, the great saint of Abyssinia. The text of the 'Kabra Nagast' shows evidence of being a translation from an Arab original, and is an assimilation of the legend of the Arabian Queen, Belkis, associated with Solomon in Quranic legend, in spite of her having been born many hundred years after him. The Habashat, corrupted into our word Abyssinian—a South Arabian tribe—were the ancestors of the ruling race, and about the beginning of the Christian era are found settled on the African side of the Red Sea, at Aksum.

Other mistakes could have been avoided by a little more care in editing, *e.g.* the Galla were not a ground race, but only appeared on the frontiers of Abyssinia in the early part of the sixteenth century (p. 100). Their principal deity is Waq, or Waqayo—not Wakweh. They are not at all unclean feeders, as are the Wattos or Waitos, a real ground race who turn up when an elephant or other uneatable big game is shot, and settle down in family parties till the flesh is so decomposed that no one can go within a hundred yards of the banquet.

King Fasil (p. 302), who ought to be Fasiladas (1632–1665), by no means "enlisted five hundred Portuguese" to fight his battles. He started a persecu-

tion of the Portuguese Jesuits and exterminated them and their converts with ruthless cruelty wherever he could find them. There seems to be confusion with Don Christovão da Gama's four hundred valiant Portuguese warriors in 1541. Constantine (p. 329) sent Theophilus to Aksum in 536 A.D., not 386.

Misspelling of common words abounds. "Koyazmatch" for "Kañya-smach," "Zabanier" for "Zabañña" (a guard), "Feterari" for "Fitaurari," "Geze" for "Ge'ez," are errors which may not detract from the enjoyment of an entertaining book, but might have been avoided. H. W.

Stalking Big Game with a Camera in Equatorial Africa.— Marius Maxwell. London: W. Heineman. 1925. 12½ × 10, pp. xxiv. + 206. *Maps and Illustrations.* 52*s.* 6*d. net.*

Mr. Marius Maxwell belongs to the new race of big game hunters whose weapon is a hand camera, and whose trophies, instead of ornamenting the walls of his ancestral hall, form the most attractive feature of the fine volume in which he tells us of his prowess.

The greater part of the present work is devoted to the elephant, in pursuit of which Mr. Maxwell paid two visits to Kenya Colony in 1922 and 1923. Accompanied by Mr. J. H. Barnes, he visited the bush country of the Amala and Mogor rivers to the east of Lake Victoria, and the Lorian Swamp, where the northern Uaso Nyiro loses itself amid the desert country to the north of Mt. Kenya; and there he took most of the wonderful photographs reproduced in the present volume. Perhaps the finest of these is the one which forms the frontispiece, of an advancing herd of seven or eight animals in the Lorian. It must indeed require nerves of steel to face at so short a distance these enormous brutes, and how he managed to escape without accident passes one's comprehension.

The elephant did not, however, entirely absorb Mr. Maxwell's attention: there are chapters on the Giraffe, Buffalo, Rhinoceros, and Hippopotamus, all illustrated with wonderful photographs. There is also a chapter on his photographic equipment. Most of the photographs were taken with a quarter-plate reflex, with a very rapid anastigmat lens of 6, or at most 10, inches focal length. This was supplemented by a telephoto lens which could be used with the same camera; but Mr. Maxwell found the telephoto lens unsatisfactory, and most of the photographs were taken with the short focus lens.

Finally, in an appendix, Mr. Maxwell sums up the characteristics of the African and Indian elephants, and gives some account of the palæontological history of the group, in which he was assisted by Captain J. G. Dollman and the late Dr. C. W. Andrews, of the British Museum, while Sir Sidney Harmer has contributed a short preface.

Without doubt Mr. Maxwell has obtained the finest collection of photographs of wild elephants and other big game animals ever taken in Africa, and his modest account of his experiences forms a fitting accompaniment to his adventurous exploits. W. L. S.

Madagascar: Land of the Man-eating Tree.— Chase S. Osborn, LL.D. London: Hutchinson & Co. 1925. 8 × 5½, pp. 443. *Two Maps, Twenty-four Illustrations.* 18*s. net.*

Dr. C. S. Osborn is an adventurous American traveller, and has produced a book which contains a large amount of information about Madagascar which will be new to American readers, but is not strange to those English people who take any interest in that great island. Its chief defect is its title, for there can be no question that such a tree as a "man-eating" one does not

exist. The story about it (pp. 1–9) was the clever invention of a German writer forty-eight years ago, and is a veritable "Munchausen" production, probably suggested by Darwin's 'Movements of Climbing Plants,' together with facts then newly ascertained about insectivorous plants. The flora of Madagascar is now fairly well known, while the whole island has been surveyed by French engineers, and it is certain that Carl Liche's account is a pure fiction. It is a pity that Dr. Osborn gives any credit to such a story. He also says that four different tribes have stories about this fabulous tree; yet although missionaries have lived among these very people for many years, none of us have ever heard such accounts!

Much that is said in this book about the country and its people, and about their customs and traditions, is fairly correct, and the author has been diligent in collecting information of all kinds; but some one who knows well the Malagasy and their language should have revised the MS. before it was printed, and so expunged numerous errors. Through want of space, only two or three of these can be noticed. On p. 254 it is said, in describing the New Year's ceremonies, that the Queen's ladies "were often naked to the waist." This is a gross misstatement and quite untrue; Hova women of all ranks are particularly careful not to expose any part of their bodies, and specially careful are those of high rank. The reviewer has been present at the royal festival a score or more times since 1864, and speaks of what he knows. That whole 28th chapter contains many other serious misstatements.

On p. 342 it is said that "no tombs, ancient or modern, are more stately and impressive than those of the Hova kings." Such a description of them is altogether incorrect; for these old royal tombs consist merely of a plain stone substructure, without any ornamentation, and are surmounted by a small wooden house, very much like an ordinary dwelling. A much more pretentious kind of tomb (see opposite p. 340) is that of a prime minister, who was not even of noble rank.

The longest chapter, that on native "Traditions and Folk-lore," might well have been much shortened; for it should be remembered that a great deal of what was common (especially evil customs) in former times has long since been abolished through Christian influence. Much of the space thus gained might have described the many good effects produced by missionary teaching. The Madagascar of to-day is a very different country from that of sixty years ago, as the present writer first knew it; and any description of Madagascar as it is *now* is very incomplete, unless its present state, as largely civilized and Christianized, is also included.

Some of Dr. Osborn's statements on scientific matters are open to grave question. For instance, he says (p. 19) that "it may be concluded that the cutting off of Madagascar [from Africa] occurred about 1000 B.C." To any one who knows the geology of Western Madagascar, this is an extraordinary opinion. Many other points cannot be here noticed for want of space. It can only be added that the book is well illustrated; and that Dr. Osborn speaks in the kindest way of missionaries, especially those of the London Missionary Society, to whom his book is dedicated. J. S.

POLAR REGIONS

Spitsbergen Papers. Scientific Results of the First Oxford University Expedition to Spitsbergen (1921). Vol. I. Oxford: University Press. 1925. 30*s. net.*

The Oxford expedition in 1921 was the first of several expeditions to Spitsbergen which were staffed largely if not mainly from Oxford. The expedition

visited Bear Island, various parts of Icefjord, Prince Charles Foreland, and a few places on the north coast, including Moffen Island. No new ground was covered, although a reconnaissance much hampered by mist was made up the Nordenskjöld glacier towards the north-east. The scientific results were chiefly in biology, especially ornithology, which was the main aim of the expedition. Papers by different members of the expedition have already appeared in scientific journals, including the *Geographical Journal*. Thirty-two of these are now collected and bound together to form the present volume, which is simply a series of reprints of various sizes, each with the original pagination. Of chief geographical interest are Mr. R. A. Frazer's paper on Topographical Work (*Geographical Journal*, November 1922), Prof. J. S. Huxley's long paper on polygonal surface markings (*Geographical Journal*, March 1924), and a contribution by Messrs. V. S. Summerhayes and C. S. Elton on the Ecology of Spitsbergen and Bear Island (*Journal of Ecology*, September 1923). In fact, the ecological point of view is kept well to the fore in many of the papers, and the volume makes a valuable contribution to our knowledge of the flora and fauna of Spitsbergen, which, on the more purely systematic side, were already fairly well known. An appendix contains short lists of polyzoa, tunicata, and hydroida, which are now published for the first time. Even if these lists are of minor importance it would be a pity if they should be lost to sight by inclusion in a large collection of reprints. A second volume, including the remainder of the papers of the 1921 and all those of the 1923 and 1924 expeditions, will be published later. In this collected form the scattered papers will be welcomed, especially by those students of the Arctic who have not ready access to well-supplied biological libraries.

R. N. R. B.

By Airplane towards the North Pole.— W. Mittelholzer and others. London: G. Allen & Unwin, Ltd. 1925. Pp. 176. *Maps and Illustrations.* 10*s.* 6*d. net.*

The principal author of this volume made some successful seaplane flights in Spitsbergen in July 1923. Of these the longest was a seven-hours' flight from Green Harbour up Icefjord and Klaas Billen Bay, across New Friesland to Lomme Bay, then along the north coast of Spitsbergen to Danes Island and southward to Green Harbour. The Junker plane was not working quite satisfactorily, and for this reason no further flights were attempted. Lieut. Mittelholzer was the first aviator to visit Spitsbergen, but so far from attempting to fly "towards the pole" he made no effort to lose sight of land. Moreover, he maintains that until airplanes have "perfectly trustworthy engines, a flight over wide stretches of the Arctic, and in especial a flight from Alaska to Europe, has only a sporting chance of success." The descriptions of Spitsbergen from the air and the rapidly changing scenery are interesting, and the air photographs are both beautiful and valuable. Prof. A. Miethe contributes a short chapter on airplane photography, and Capt. H. Boykow and Prof. K. Wegener add a brief discussion on the geographical value of the photographs. Prof. Wegener, whose previous knowledge of Spitsbergen was due to a year at the German Meteorological Station in Ebeltoft Haven, also contributes a general geographical and historical introduction to the book. This leaves scope for revision. The season for the shipment of coal is not "a few weeks" but five months, and during that season the seas are not "full of drift ice." The steamers which carry the coal are ordinary steel cargo boats unprotected in any way against ice, which they seldom sight. The seal fishery cannot be said to have taken the place of the old-time whale fishery, for seals are hunted on

the edge of the pack to the west and east of Spitsbergen, and are not seen in its coastal waters. Prof. Wegener is clearly not well informed regarding modern economic and historical developments in Spitsbergen. The volume is a translation of the German original which appeared two years ago. It has no index. R. N. R. B.

PHYSICAL AND BIOLOGICAL GEOGRAPHY

Les Lacs. Leur Mode de formation—Leurs eaux—Leur destin.— Léon W. Collet. Paris: Gaston Doin. 1925. Pp. 300. *With 28 Plates and 63 Text Figures.*

Professor Collet possesses unique qualifications for the task of writing a standard text-book on this subject. Trained in the geological school of Geneva, in a country where the study of lakes is a matter of vital concern to the nation, he took an active part in the survey of the lakes of Scotland under Sir John Murray, and after further experience in South America, occupied the post of Director of the Hydrographical Survey of Switzerland until called to the Professorship of Geology at his old University.

The study of his book justifies the expectations aroused by its appearance. In spite of the fact that it contains little more than 300 pages, we know of no other work on limnology so comprehensive in its scope. Besides standard topics, such as the mode of formation of lakes, many other less familiar aspects of the subject are dealt with, all of which are of considerable scientific interest, and some of great economic importance. The author quotes experimental evidence or actual measurements whenever possible, and has himself obtained much of the data upon which his conclusions are based.

The plan of the book is orderly in the extreme. It is divided into three nearly equal parts, each part into chapters and each chapter into numbered sections, the last being a bibliography. Part I. is devoted to the mode of formation of lakes, the classification adopted being based on those of de Martonne, Peach and Horne, and James Geikie, and each type recognized receives a chapter. The author's investigations have confirmed his belief in the production of lake basins by glacial erosion, and he attributes such an origin in whole or in part to the great bulk of Alpine lakes, quoting some interesting new evidence obtained after the artificial lowering of Lake Ritom. In the Alps solution of limestones is also shown to play an important part in the formation of lake basins, especially where moraine has rendered their floor impermeable.

Part II. deals with the water of lakes and contains a great number of important observations. Attention is first directed to the water supply of lakes and its seasonal and other variations. Many vague statements have been made as to the value of a forest covering in checking the run-off from a hilly region, but here we find exact figures measured by the Swiss Forest Service over a number of years which prove the value to be a high one. Subsequent chapters are concerned with the thermal stratification of lakes and its consequences, the chemical composition of lake waters, leading to a consideration of salt lakes and the effect of changes of climate, and the colour of lakes, another subject often discussed but rarely understood.

In Part III. the value of the results obtained in Switzerland by the Hydrographic Service and other workers are even more apparent, for this portion of the book deals mainly with lacustrine sedimentation. Exact observations have been made upon the sediment carried in suspension in a number of rivers and the material rolled along their beds, upon the rate of growth of

deltas in lakes and reservoirs, and the nature of the deposits forming on their floors. Detailed descriptions and figures are given of the special apparatus employed for these purposes. The results obtained, besides being of the greatest value to engineers, enable certain calculations to be made which have some general interest; such as that about 42,000 years would be sufficient to fill up completely the Lake of Geneva if the present rate of deposition were to continue, and a modification of the figures originally calculated by Heim for the duration of post-glacial time, which the author now reduces to not more than 10,000 years for the period intervening between the Bühlstadium and the present day, a figure comparable to those obtained in Sweden by de Geer. Sub-lacustrine landslides are shown to be of frequent occurrence, and it may well be that similar phenomena are of importance on steep submarine slopes. A final chapter deals with lakes, natural and artificial, from the point of view of their utilization as sources of water power, where the author rightly insists on the necessity for close cooperation between the geologist and engineer, and indicates the hydrographical and geological factors which much experience in the Alps has shown to be necessary to take into account. There is a useful index.

The book is clearly written and well printed, and the numerous plates, not a few of which are of high artistic as well as scientific merit, are excellently reproduced; it can be thoroughly recommended to all, whether geographers, geologists or engineers, who are interested in the past, present, or future of lakes. T. C. N.

HUMAN AND HISTORICAL GEOGRAPHY

Politische Geographie.— Otto Maull. Berlin: Gebrüder Borntraeger. 1925. 10 × 7, pp. xiv. + 742. *Sketch-maps.*

This laborious work is further evidence of the aspirations of one school of geographers. The author submits that the thorough study of the surface of the Earth is a task beyond the achievement of the geographer, but at once proceeds to outline as the aim of the more limited body of political geographers a task, one would have thought, even more stupendous, the determination, apparently, of the springs and controlling factors of man's activities. To fit himself for this task the student must at least possess the elements of the several allied sciences, though these may be treated cursorily. His task then becomes synthetic: he must aim at producing a picture of the Earth or of one of its component regions. Having achieved this, his difficulties then begin to thicken, for he must now turn his attention to man. Here the author develops the theories of Ratzel, Hettner, and others. In the first place, the causal dependence of man upon nature, with but few modifications, is insisted upon as the fundamental principle. Acting upon and through man, the natural region becomes a cultural region, and one of the intermediary links in this development is the State. At this point history, after having been relegated to a minor position, secures its revenge by compelling political geography to seek a definition of this term; and the author soon finds himself saddled with that conception so fruitful of difficulties and errors, the Neo-Hegelian conception of the State as an organism. After some pages of semi-philosophical speculation there emerges the not very helpful definition of the State as a synthesis between a portion of humanity and a portion of the Earth's surface. The political geographer must therefore proceed on lines similar to those of a biologist or zoologist.

The author then launches into a dissertation upon the "life processes of

states," followed by a detailed analysis of characteristic geographical features of states as they exist or have existed. In these chapters there is a large amount of facts, historical and geographical, but one cannot help feeling that those of significance are obscured by being embedded in this elaborated system. In the chapter on Sea and Land there is naturally much on the growth of British world power, written from a very definite point of view, not exactly hostile but rather of regretful admiration and envy of the blessings bestowed by nature. This is, however, an oft-told story. There is also much detail of a semi-statistical nature, such as the proportion between the area of the Mother countries and overseas possessions, the racial and religious compositions, and sketch-maps showing the "Maritimät" of the countries of the world, the distribution of ruling and subject peoples, and so forth. It may be worth noting that one table designed to show national homogeneity is headed by Germany, opposite which in a column entitled "Irredenta nach innen" appear the names Elsass-Lothringen, Rheinland, Dänemark, Polen u. Memelgebiet, and others. Great Britain and Ireland appear farther down among states with a predominating nation and other included nationalities. The United States is placed in an even lower category. Then a sketch-map, which classifies for example the British Isles, Iceland, Madagascar, and Australia in one class, and Alaska, Finland, and India in another, does not seem to contribute much to an understanding of political geography. The amount of reading that must have gone to the writing of this book is prodigious: there must be well over six hundred authors quoted alone. Whether it is justified by its fruits must be a matter of opinion. G. R. C.

Bering's Voyages.— **F. A. Golder.** Vol. **2.** New York: American Geographical Society. Research Series No. 2. 1925. Pp. xii. + 290. *Maps and Illustrations.*

The first volume of this work, which contains Bering's voyages from his own log books, was reviewed in the *Geogr. Journ.*, **63**, p. 77. The second and last volume is occupied by Steller's journal of Bering's voyage to America, Bering Island, and back to Kamchatka, and Steller's description of Bering Island with his account of the animal life, including the sea-cow (*Rhytina stelleri*), the peculiar dugong which has been long extinct. These journals are of great value, for Steller was the first man of science to visit the northern Pacific seas, and the only one who ever saw a live sea-cow. But the pages are not occupied solely with natural history or even with scientific observation. Steller has many comments (often of a caustic nature) to make on the officers and conduct of the expedition. The journal, which was written in German, was published, after considerable editing, in St. Petersburg in 1793 by Pallas in his *Neue Nordische Beiträge*, vols. 5 and 6, and separately as a booklet. The description of Bering Island was included by Pallas in vol. **2** of the same work in 1781. The manuscript from which the present version was translated was found in the Russian Academy of Sciences in 1917; it appears to be a copy of Steller's original account, and contains matter which Pallas omitted in his version. It is thus the first complete English translation of the Journal. Mr. Golder has had the help of Dr. L. Stejneger, especially in the biological notes. This is a great advantage, since Dr. Stejneger has paid several long visits to Kayak and Bering Islands and Kamchatka. The volume is a scholarly piece of work admirably illustrated by charts and photographs. It concludes with bibliographies of Steller's works, notes on the Commander Islands, and addenda to the bibliography in the first volume. R. N. R. B.

The Journal of his First Voyage to America.— Christopher Columbus. London: Jarrolds. [N.D.] 8½ × 5½, pp. 251. *Illustrations.* 12*s.* 6*d. net.*

The title of this well-presented volume is misleading. The translation before us is a reprint, with the addition of a few notes and a somewhat lyrical but inadequate foreword by Mr. Van Wyck Brooks, of a work first issued in 1827; and the original of this century-old translation was not the Journal of Columbus. It was no more than an excerpt from the monumental 'History of the Indies,' written about 1560 by that ardent defender of American native tribes, Father Bartolomé de las Casas, and consists of a running narrative of the first voyage of Colón. Las Casas had access to a Journal written by the navigator, and here and there quotes passages which purport to be, and probably were, *verbatim* extracts, chosen to suit the particular purposes of the good "Apostle of the Indians." These extracts alone give colour to the title of this reprint of Kettell's translation.

So far as is known, the Journal of Columbus does not, in fact, now exist. There were, at one time or another, two such day-to-day accounts written by Columbus, but one (and probably the original) was thrown overboard in a cask when danger of shipwreck arose on the homeward run after the discovery of the West Indian Islands, and was never seen again; the second diary was that seen by Bishop de las Casas, and although it is not impossible that it may still lie in some forgotten corner in Spanish archives, it was never published, and has long since been no more than a legend. However, authentic and detailed accounts of the first discoveries of Colón survive in the two well-known Letters of Columbus, known as the Spanish and the Latin letters respectively, of which English translations were published as long ago as 1870 by the Hakluyt Society of London.

The editor's preface would gain by the inclusion of frank details of the origin of the document and dates of publication and translation; there is no index, but the notes, consisting of extracts from a few historical documents, are of interest. L. E. E.

GENERAL

Hakluyt Society's Publications, Series II. vol. **53. The Life of the Icelander Jón Ólafsson, Traveller to India.** . . . Translated from the Icelandic edition of Sigfús Blöndal by **Bertha S. Philpotts, O.B.E., M.A., Litt.D.** Vol. **1.** Life and Travels: Iceland, England, Denmark, White Sea, Faroes, Spitzbergen, Norway, 1593–1622. Edited by the Translator. London: 1923. 9 × 6, pp. xxxiv. + 238. *Four Illustrations and Two Maps.*

The Same, vol. **55. The Travels of Peter Mundy in Europe and Asia, 1608–1667.** Edited by **Lieut.-Col. Sir Richard Carnac Temple, Bt., C.B., C.I.E., F.S.A.** Vol. **4. Travels in Europe, 1639–1647.** London: 1925. 9 × 6, pp. xlvi. + 280. *Seventeen Illustrations (by the author) and Four Maps.*

Though both of these books deal with Northern Europe during a critical period of the seventeenth century, they are very different in style and contents. Jón Ólafsson was the shrewd but uncultured son of an Icelandic farmer, who became an artilleryman in the service of that ambitious monarch, Christian IV. of Denmark. He writes, therefore, mainly of life in the guard-room, in Copenhagen lodgings, and on the soldiers' deck, and does it with considerable charm. Of his royal master he leaves an attractive picture. Jón was fortunate in accompanying several of the naval expeditions which the king sent out to

increase Denmark's power on the sea and her possessions in distant lands. Thus in 1618 he saw Jens Munk depart, with the *Unicorn* and *Lamprey*, on that ill-fated attempt to find the North-West Passage from which only Munk and two men returned; he pursued and captured pirates off the coast of Lapland, and he witnessed the first attempt to establish a Danish whaling industry at Spitsbergen (1618). Basques, who were noted whalers, were brought to Spitsbergen to instruct the Danes. The English and Dutch were already whaling there regularly, and had built huts on the shore. While they disputed as to whom the country belonged, the Danish admiral stepped in and claimed it all for Denmark. The Dutch had, in fact, discovered it in 1596, while the English got there in 1607, and were the first to kill whales there. Ólafsson found the English intrepid and very hardy, but always anxious to keep the peace; during his short stay in England on his way to Denmark, he was well treated by everybody except a rascally Ipswich innkeeper. At Vardø he met John Cunningham, *alias* Hans Køning, an eccentric Scot who had helped to rediscover Greenland for the Danes in 1605, and had been made Governor of Vardø to suppress the magical practices of the Finns, or rather, Lapps. Jón's account of life in Denmark shows a very prosperous and happy people, though they believed in witchcraft and were somewhat given, for the female part, to eloping with German soldiers. Germans were numerous at Copenhagen, partly because the king, in spite of Court opposition, was favourable to them. The lower-class Germans were skilled craftsmen and simple folk; the nobility, if Count von Grabow was a typical specimen, were not so desirable. But in all circumstances Ólafsson remained a staunch Icelander. The monopoly which the Danes possessed of trade with Iceland and their high prices and bad goods made him indignant; and he was much grieved that the people of the Færoes were adopting Danish customs and the Danish language.

Peter Mundy, on the other hand, was a veteran and enthusiastic traveller, with whose diaries members of the Hakluyt Society are already familiar. He is full of varied information about all the places he visited, which in this tour included the English midlands, Kent, Holland, Bremen, Hamburg, Lübeck, Pomerania, Poland, and Archangel. The book is therefore more in the nature of a work of topographical reference than a tour. His description of Oxford and Cambridge colleges, of the Stuart mansion at Theobalds, and of the great Stourbridge Fair, are especially interesting, though his contempt for Cambridge University as compared to Oxford was even then unreasonable. Later he explains that famous but mysterious object, the Great Bed of Ware. On the Continent he stayed for some months at Danzig, of which he writes at length. The Scots were so numerous there that they had a quarter to themselves (still known as "Alt-Schottland"), and admitted the merchants of the English staple to their "Brotherhood." English and Scots were also strong at Rotterdam. Mundy has a great admiration for the Dutch, their cleanliness and their methods generally, an admiration which they thoroughly deserved, even though the tide of their prosperity was soon to turn. Indeed, he found Dutch trading ships everywhere, while the rest of Northern Europe was busy fighting. At Archangel the Dutch were the chief rivals of the English traders, whose chief man was Thomas Wyche, one of a notable family. Mundy's account of Archangel and of the Samoyeds is valuable. He even includes a short vocabulary of the Samoyed language. Poland was an important and prosperous kingdom, and Sweden, though powerful east and south of the Baltic, had not yet increased her possessions at the expense of Christian IV. of Den-

mark. Mundy gives a detailed description of the costumes and head-dresses of the peoples he visited, with many quaint drawings.

Both these books have been edited with the thoroughness and scholarship associated with the best of the publications of the Hakluyt Society. Miss Philpotts' translation of Ólafsson's far from easy Icelandic is admirable. This book is illustrated by a portrait of King Christian IV. and by several old views, etc. There is also a sketch-map of localities in Iceland mentioned by Ólafsson, but no general map to illustrate the author's voyages; if a contemporary Dutch map or chart could not be reproduced, a sketch-map might have been included. Though Sir William Temple is best known as an authority on India, his notes and illustrations to these northern wanderings are thoroughly well done, and he has provided useful route-maps. E. L.

Whalers and Whaling.— E. Keble Chatterton. London: T. Fisher Unwin. [1925.] 9 × 6, pp. 248. *Illustrations.* 12*s.* 6*d. net.*

The history of the whaling industry must always have its appeal to our countrymen, for the whalers have in no small measure influenced the adventurous spirit of our race.

The story told by Mr. Chatterton is linked up with that of exploration in many seas, and in his book is to be found evidence of influence exercised by that exploration on the discovery of fresh fields for the whaling industry—an influence aptly illustrated by the expedition the *Discovery* is now engaged upon. The early Norwegian and Dutch whaling enterprises are referred to and their methods are discussed in simple and intelligible terms. The fluctuating fortunes of whaling, both in the Northen and Southern Hemispheres, since the end of the sixteenth century, are discussed. We read how the South Sea Company—of "Bubble" notoriety—carried on a legitimate whaling business, but, notwithstanding bounties from the Government, was obliged to discontinue it. Later, the American War of Independence favoured the activities of the British whalers in the southern seas—now the chief sphere of whaling activity. After fifty or sixty years of prosperity, the exhaustion of the fishing grounds operated in causing the industry to reach a very low level towards the middle of the nineteenth century. The somewhat adverse conditions suffered by it during the latter part of that century are discussed, and the remarkable developments brought about by newer methods and better-equipped vessels in the southern seas during recent years are set forth in a most interesting manner. Nor does Mr. Chatterton fail to give due credit to Larsen for his pioneer work in these advances. Whaling implements, the modern whaling practice, which dates from the successful introduction of the harpoon gun in 1865, are described in detail; and particulars of the old whale ships, their equipment, their voyages, and the gallantry and endurance of their crews, are set forth in this book with the vigour and freshness that may be expected from an ardent lover of the sea. A few errors unnoticed by the reader may be corrected in a later edition; among them, "date" for "data" on p. 28; "1825" for "1925" in the footnote, p. 171; and "August" for "September" on p. 175, line 21. M. T. T.

Sea Wake and Jungle Trail.— H. Warrington Smyth. London: John Murray. 1925. 9 × 6, pp. xviii. + 324. *Illustrations.* 16*s. net.*

That the hesitation of Mr. Warrington Smyth to record his collection of "yarns" should have been overcome, is matter for congratulation by all lovers of the sea and travellers in wild country. In this account of some of his experiences he embraces canoe voyages, deep-sea cruising in small craft, and journeys by elephant transport; and we read in well-written pages, reinforced

by numerous illuminating sketches, incidents of an adventurous life spent in Indo-China and about its waters. In a lively account of an "ocean" race one appreciates the author's knowledge of everything appertaining to small-boat sailing; he matched his 22-foot canoe-yawl, with her battened lug-sails, against a Clyde-built yacht manned by sportsmen of another virile sea race. His victory, it is stated, gave the King of Siam occasion to express his view that "those English are undoubtedly the men to whom I like to entrust my son!" The book contains some interesting episodes bearing on the ways of the elephant when in the service of man, but its appeal is strongest to the yachtsman and small boat cruiser; and these will find not the least interest in the concluding chapter, which summarizes the author's experience and contemplation of such sailing as "a way of life." M. T. T.

The Journal of a Jewish Traveller.— Israel Cohen. London: John Lane. 1925. 9 × 5½, pp. 288. *Thirty-one Illustrations and a Sketch-map.* 15*s.*

This is an entertaining and amusing record of an amazing journey—not that the routes are new, but the object is unique. Mr. Cohen made his pilgrimage to Australasia, India, and the Far East in the interests of Zionism and to collect funds for its support. He certainly appears to have succeeded better than most would have done. In Australia alone he raised £58,000 among 18,000 Jews in the Commonwealth, and in New Zealand he collected £20,000. Such sums may seem small to one bent on raising a million, but few, we venture to think, would have done as well. The author's account of the scattered members of his race in out-of-the-way corners of the Earth is both amusing and instructive. It throws an interesting light on the persistence of national traits under very diverse circumstances. The account of the extraordinary condition of the mixed peoples in Harbin in 1921 is of special value. Of geographical description there is little, the best being the account of the district of Rotorua, in New Zealand. The journey, appropriately enough, was staged to begin and end in Palestine, and the first and last pages give accounts of Zionist activities, but, it must be owned, they add little to what has been already fully told elsewhere. The volume, though of special appeal to Jews, will be found interesting by all those interested in modern Jewry.

Shanghaied out of 'Frisco in the 'nineties.— Hiram P. Bailey. London: Heath Cranton, Ltd. 1925. 9 × 5½, pp. 187. *Illustrations and Diagrams.* 7*s.* 6*d. net.*

In this unaffected narrative of an enforced voyage across the Pacific in a four-masted barque, there are all the features of the conventional "romance" of the sea. Among the crew were two clergymen, three bar-tenders, and four agricultural labourers, all of whom, with the author, had been doped and "shanghaied." The food was bad, and for the early part of the voyage the crew suffered much at the hands of the first mate, guilty of some astonishing acts of cruelty. Then, in the good old style, one of the temporary sailors fights the bully to a finish. To all this, without sacrificing any effect, Mr. Bailey succeeds in imparting an atmosphere of reality. During the voyage he made first-hand acquaintance with sea life, and appears as a master of a variety of slang. One of the incidents he relates, "The strange death of Old Man Smith," is strangely effective in another and a weird genre. The only blemish in an entertaining book is the frequent and rather obvious moralizing and sententiousness.

THE MONTHLY RECORD

EUROPE

Old Oak Woods in England.

THE *Journal of Ecology* for September 1925 contains two papers dealing with remnants of old forests in England, composed mainly or largely of oaks. In the first, Mr. W. Leach describes two patches of upland oak wood on the hill slopes overlooking the Newlands valley in Cumberland, some 5 miles from Keswick, which he considers to be as nearly virgin in nature as any others in Great Britain. They are known as the Birkrigg and Keskadale oaks. Both occupy similar positions in respect of aspect and slope of ground, both facing south and lying between the 1000-feet and 1500-feet contours. Both also are practically pure associations of *Quercus sessiliflora*. Both grow on shallow and stony argillaceous soil, and, as might be expected, the trees are stunted, and instead of a single trunk have mostly a number of stems springing from a single stool. Although this may be due to "coppicing" in the one case (Keskadale), in the other there is no evidence of this, and the form seems to be due to the effect of fires. In the Keskadale oaks the trees vary in height according to the slope, being tallest where there is more or less of a hollow on the hillside, so that there is a marked uniformity in the upper surface of the wood. This seems due to the effect of the winds. These two woods, now only 400 and 600 yards in length respectively, seem to be the remains of more extensive woodlands, and may themselves ultimately disappear owing to the failure of natural regeneration by seedlings.

The other paper, by Mr. E. J. Salisbury, describes the vegetation of the Forest of Wyre on the borders of Worcestershire and Shropshire, which is one of the larger areas of natural woodland remaining in Britain, it being still possible to traverse something like 5 miles of continuous woodland, both from east to west and from north to south. Within historic times Wyre forest was continuous with other great forests now represented by small scattered woodlands and a few large ones. The destruction of these forests is easily explained by the demand for wood as fuel for the evaporation of brine at Droitwich and for iron-smelting in the Stourbridge district. The present wooded area occupies high ground sloping west to the Severn and divided in two by the deep valley of Dowles Brook, the upper limit being from 400 to 500 feet. Situated on the Middle Coal Measures, almost entirely composed of non-calcareous rocks, the soil is that of a typical habitat of *Quercus sessiliflora*, which is not only the dominant tree but often occurs in nearly pure stands. Owing to the uniform character of the rock subsoil, the forest affords an excellent opportunity of studying the differentiating action of the progressive leaching of the soil, whereby the higher parts have become exceedingly poor in bases, especially calcium, while the lower are enriched by the salts leached from above. This finds expression alike in the tree, shrub, and herbaceous vegetation.

John Ogilby and British Road Books.

Sir George Fordham has given us another of his careful Bibliographical studies in a paper on John Ogilby reprinted from the *Transactions of the Bibliographical Society*, 1925. Ogilby's versatility and industry were such that a complete bibliography of his literary output would be a big task, and Sir George has here restricted himself to that part of it which was concerned with British topography. His work in this direction began only after the loss of all his stock-in-trade by the Great Fire in 1666, and it was all compressed into the

ten years between this and his death. Having been appointed "King's Cosmographer and Geographic Printer," he was one of the four "sworn viewers" to survey the burnt-out area, one of his associates being William Morgan, his wife's grandson, who, after Ogilby's death, published the results of the survey in a large-scale plan of the whole city, which later received Royal support. In May 1669 Ogilby put out plans for an "English Atlas," an ambitious undertaking which was to include volumes on each of the continents, and also one dealing with English topography, embodying the results of an actual survey of the roads, for which a Royal Warrant was issued in 1671. It was carried out at great cost and labour, and the first results were embodied in the 'Britannia' of 1675, a folio volume containing a hundred plates of the roads, accompanied by two hundred pages of explanatory text. Correct measurements of distances by road were thus first made available, and for more than a century this work supplied the sole basis for all the publications of the kind issued during that period. The work, as originally planned, was never completed, the 'Britannia' of 1675 remaining alone as volume I of the intended publication, though before his death Ogilby had commended its continuation to his relative, and successor as King's Cosmographer, William Morgan. A second folio edition appeared in 1698, followed in 1699 by an edition of the text without plates in the form of an 8vo pocket volume. Pocket epitomes of the original tables were also brought out in a long series, the first in 1676 by Ogilby himself, others by William Morgan, and others after the latter's death, with additions as time went on. The maps were first produced in pocket form in 1719, in which year two versions appeared, the better of the two by John Senex. This remained the type of such guides for a number of years, the plates being copied by other map-makers. It may be worth noting that in the title to the 'Britannia' we find Wales spoken of, not as a Principality, but as a Dominion, thus supplying an early instance of the use of the latter word for a dependency of the British Crown; also that the tenth (1745) edition of the pocket book has "A List of the Principal Trading Towns to which Letters are sent every Night from the Post Office in London," as well as "An Account of the Penny Post."

ASIA

Movements of Indian Glaciers.

With reference to our article in the *Journal* for October 1925 on the movements of certain glaciers in the Himalaya, Major Kenneth Mason writes to call attention to observations of two glaciers made by him when working in Hunza-Nagar in 1913, which supplied a means of comparison with the position when the same glaciers were marked by Mr. Hayden. One, the Hasanabad, was still in the same position as when marked, but the other, the Minapin, had advanced slightly (see 'Records of the Survey of India,' vol. 6, pp. 48, 49, with diagram and photograph). Before Mr. and Mrs. Visser started on their journey of exploration last summer Major Mason gave them details of Hayden's marks for all glaciers in Hunza-Nagar, and his own also. He has since heard that they once more measured the two glaciers above mentioned, and report that the Minapin has retreated considerably since 1913, no movement of the other being mentioned. It is to be presumed that comparative records of all glaciers measured are kept by the Geological Survey of India, Calcutta.

AFRICA

Aerial Routes to Dakar.

M. C. Lemoing discusses the alternative aerial routes between Paris and Dakar in the *Bulletin de la Société de Géographie du Maroc*, t. iv. 4, 1925

The routes are across the Sahara or along the coast of Morocco. The primary requirement is safety; in crossing the Sahara the lack of effective guidance by maps or natural features and the probable existence of compass deviations have to be met. The wear and tear of the engines would be greater through the action of sand, and the consumption of petrol would be greater and its provision more difficult. The meteorological conditions are also more unstable, and the establishment of posts to provide forecasts and assistance would be difficult. On the other hand, by following the route Tangier, Mogador, Canaries, Dakar, many of these disadvantages would be avoided. The coast-line is easy to follow; there are numerous stations equipped with wireless and reliable meteorological data exist. It is upon the latter consideration that M. Lemoing mainly rests his case. The dominant winds over the sea between Tangier and the Canaries are from between east-north-east and north-north-east; between the Canaries and Dakar from north-east to north-north-west. The coast of Morocco does not lie always within the *régime* of the trade wind. At Casablanca from May or June to October or November it is, but from December to April the winds are from the south and west. South of 26° the coast is entirely under the trade-wind *régime*. Observations show that the trade winds persist up to an altitude of about 1500 metres, and are surmounted by variable currents, and these again by a definite anti-trade at 2000 metres and over. At Tenerife the winds are most frequently between north and north-east, particularly from April to June, while south-west winds are most frequent above 2000 metres. On this route, therefore, from April to November there is a definite predominance of north-east winds up to 1000 metres, and during the same period an equally sharp predominance of south-west winds above that height. M. Lemoing suggests, therefore, that machines would be able during those seven months to fly from Casablanca to Dakar with a following wind at 1500 metres, and to return at 2000 metres, also with a following wind. The occurrence of clouds or mists would not be sufficient to handicap this route.

The Tsetse-fly Problem in Central Africa.

We have received from the Society for the Preservation of the Fauna of the Empire a short pamphlet on the tsetse-fly problem and its solution. The problem is one of the most urgent confronting the various administrations of Central Africa, as has been emphasized in the recently published Report of the East Africa Commission. The object of the present pamphlet is to show that it cannot be solved by any one solution, and to protest against attempts at its eradication by the wholesale destruction of the fauna, without further inquiry into the results of such a policy. This destruction, as happened with the rinderpest epidemic, will not achieve its object, but may simply cause the fly to devote its attention to domestic animals and to human beings. In the Northern Transvaal, though the disappearance of the fly was accompanied by the extinction of certain large wild animals, it took place without a general settlement of Europeans, and many other wild animals still remained as possible sources of food. An extended study of the relations between the fly and the larger mammals, such as has been begun in Tanganyika Territory, is very necessary. The impossibility of exterminating the game completely should also be recognized. The efforts of unskilled hunters have sometimes resulted merely in an extension of the fly area. In the Congo, moreover, the relative lack of game in sleeping sickness areas has been noted. The pamphlet recommends as methods of combating the plague, accompanied by further research, first, the prevention of its entry into fresh areas. This could well be done by the localized control of game through the establishment of

game reserves. Then the fly must be destroyed or disinfected. Where it is approaching a thickly populated region, it may be checked by keeping the bush well cut back from the settlements. In less densely peopled districts, good results have followed from the burning of the bush in late autumn. Between the fly areas and pastoral districts the establishment of a belt of small agricultural holdings, well cleared of bush, is recommended. The pamphlet concludes by pointing out some of the disadvantages that would follow the total destruction of the fauna. These hardly need to be stressed, but it may be noted that the domestication of the eland and the buffalo for use in infected areas is suggested as a possibility.

The Gold Coast Review.

We have received the first number of a new periodical to which we extend a warm welcome—*The Gold Coast Review*. This is issued under the auspices of the Government of the Gold Coast, and is on sale at the office of the Colonial Secretary, Accra, and at the office of the Crown Agents for the Colonies, Milbank. It is intended for the present to publish it twice a year; the price of the first number is five shillings. An introduction by Mr. C. W. Welman, Secretary for Native Affairs, sets out very clearly the aim of the journal—to stimulate the collection, and to provide for the preservation and dissemination of information of value to the colony, particularly in ethnology, anthropology, and archæology. Though this first number contains articles mainly by political officers, it is not intended to confine contributors to that service, and the co-operation of members of the business community and of the educated Africans is sought. As Mr. Welman writes, "We want the Gold Coast to be not merely a country which provides salaries and pensions for its officials, and the rewards of commerce and industry for private European enterprise and for the energetic among its own sons, but a land of thought and interest and culture." Of the ten articles the greater number are devoted to the history and ethnology of various districts. A short paper by the Rev. A. G. Fraser on "Denationalization" emphasizes the difficulties in bridging the gap between the old and the new social order, the danger of neglecting to study thoroughly the native temperament and environment, and the part which education will play in the country's future. There is also a translation of several French official documents relating to affairs in French Togoland, including a codification of native marriage customs. The Outline for the guidance of those contributing general accounts of tribes or regions might have been amplified under the heading "Physical distribution." It is hoped that it will be possible to illustrate future numbers with photographs and sketch-maps.

AMERICA

A Great Crater in Alaska.

An addition has been made to the list of the World's great craters by the discovery in 1922, by a geological survey party under Mr. R. H. Sargent, of a gigantic extinct crater in the Alaska Peninsula, 24 miles north-west of Aniakchak Bay, to which the name Aniakchak has been given. In the long chain stretching for nearly 600 miles along the axial line of the Alaska Peninsula and the Aleutian Islands, and containing more active or recently active volcanoes than the whole of the rest of North America, there had been supposed to be a wide gap in the series at this part of the peninsula, and this is now filled in by the new discovery. An interesting account of the crater is given as Professional Paper 132—J of the U.S. Geological Survey by Mr. Walter B. Smith, one of the geologists who have visited the spot. From a distance the

existence of the crater would hardly be suspected, as it lies within a cluster of rather gentle peaks, separated from the nearest mountains by broad level areas. Evidence of an ancient eruption is however given by deposits of volcanic ash, which even at 18½ miles' distance have been cut into to a depth of from 6 to 12 feet by the stream known as Ray Creek. The boldest part of the outer rim is to the east, and one of the streams falling from the glaciers of the rim plunges at least 1000 feet vertically. The crater has a diameter of from 5¾ to 6¾ miles—a size rarely equalled, though only about half that of the giant craters of Ngorongoro, in East Africa, and Aso-san in Japan. The Aniakchak River rises within and breaks through the rim to the east in a narrow and picturesque canyon. The lowest part of the floor (towards the north-east) is 1100 feet above sea-level, and is occupied by Surprise Lake, with an area of 2 square miles. In the south centre there is a large cinder cone. The inner wall is abrupt—in places nearly vertical—and the rim rises on the south side to 4200 feet above the sea, one of the sharpest peaks being Black Nose, immediately south of the canyon. Where exposed, the inner wall seemed composed of layers of pink and black lava—probably obsidian—but the cliffs of the canyon and the lower part of Black Nose are composed of nearly horizontal sedimentary strata, probably of Upper Jurassic age, judging from the fossils. The summit of Black Nose apparently consists of lava. Everything points to the formation of the crater by explosive action rather than subsidence, though all other known craters of equal size seem to owe their origin to the latter. The crater of Katmai, also of the explosive type, measures only 3 miles across.

Before the eruption the site was probably occupied by mountains of moderate altitude composed of sedimentary rocks, many of the volcanoes of this peninsula having originated in such mountains. The height of some of them has been considerably increased by successive lava-flows, and there are signs that a cone formed in this way may have once towered above the Aniakchak crater to a height of some 6000 feet above the sea. Were this true, the material removed would amount to some 15 cubic miles, an appreciable part of which is still to be seen in the ejecta now covering an area of 300 to 400 miles on the east and south alone. From the absence of traces of extensive glaciation since the eruption this may be supposed to have taken place in post-Pleistocene time, but the volcano may still be one of the oldest along the Aleutian Range.

MATHEMATICAL AND PHYSICAL GEOGRAPHY

Regions of Maximum Rainfall.

Up to a comparatively recent time Tolmezzo, in the Carnic Alps, was regarded as the meteorological station with the heaviest rainfall in Italy, the mean annual fall being about 2500 mm. (100 inches); but more recent investigation has transferred the wettest locality at present known to the Ligurian Appenines, where at one place, Cabanne, the quantity averages 3404 mm. (136 inches), and at another, Viganego, 3325 mm. (133 inches). The data in question and other details of the Italian rainfall survey are discussed by Prof. F. Eredia in an article entitled "Le Precipitazione acquee nelle regioni più piovose dell' Italia," published in the *Rivista Geografica Italiana* for 1924. He proceeds to compare these wet Italian localities with those in other parts of Europe, with references, also, to extra-European regions. At Krvice, near Cattaro, Dalmatia, the most recent estimates place the annual rainfall at 4640 mm. (185½ inches), the highest apparently on the Continent, though this is stated to be slightly surpassed by the Stye Head Pass, Cumberland, where 4674 mm.

(187 inches) fall annually. It is not mentioned that this excessive English figure is now thought to be exceeded in Wales, where in Cwm Llyddaw, on the eastern flank of Snowdon (y Wyddfa), the amount is close upon 200 inches, which, as far as is known, is thus the highest not only in the British Isles but in Europe. Extreme records like these are, of course, highly localized mountain falls, but they always signify a very heavy rainfall over a wide surrounding region. The number of days in the year over which the above-quoted Italian figures are spread is remarkably low, only 113, in comparison with 200 to 250 and upwards in the wetter parts of England, Scotland, Ireland, and Norway. That the conditions of raininess, as judged by combination of quantity, persistence and frequency, in the mountainous parts of the British Isles are extraordinarily severe is thus statistically evident, and apparently they are only rivalled, or possibly locally surpassed, in the New Zealand Alps, the coast of British Columbia, the Colombian Andes, and some of the Malaysian islands. As regards the world maximum rainfall at Cherrapunji in the Kasia Hills, Assam, this is quoted by Eredia at 10,857 mm. (434½ inches), but it is chiefly concentrated into the months of the south-west monsoon, and extends in all over only 159 days in the year, or fewer than the 600-mm. (25 inches) fall in the drier parts of England. Finally, Eredia refers to a five-year record on Mount Waialeala, Kauai Island, Hawaii, giving the enormous annual average of 12,500 mm. (500 inches), which if substantiated for a long period of years would eclipse the Assam figure.

HUMAN AND HISTORICAL GEOGRAPHY

"Natural" Boundaries.

In a brochure of 63 pages, published by the Innsbruck University Press in 1924 (' Der Auffassung der " natürlichen Grenzen " in der wissenschaftlichen Geographie ') Dr. Johann Sölch discusses the question of so-called " Natural " Boundaries. He first traces the development of the concept of natural boundaries, mainly by geographers of recent generations, though the author goes back to Strabo in his search for beginnings ; he is also largely concerned with the multiplicity of terms used by German writers in the discussion of this concept. This study arose out of that of the southern boundary of the Austrian Tirol, and illustrates how a general problem may arise from a local investigation. Prof. Sölch holds that the term " natural boundary " (or frontier) has been employed to denote at least four distinct types of frontiers, which should be clearly distinguished. They are : (1) Frontiers clearly defined by a natural feature, such as the sea ; (2) frontiers formed by natural barriers which do not provide any definite boundary-line, such as mountains or deserts ; (3) frontiers which nearly conform to transition zones between distinct natural regions, but are not necessarily marked by any well-defined physical features ; (4) boundaries which are reached, actually or potentially, as a result of the natural growth of a state. Most geographers will agree that the first three types are natural, but the fourth is surely a totally different conception, dependent mainly on political ambitions and power rather than on geographical facts.

The second, and larger, part of the paper deals with modern views on natural boundaries, and summarizes those of many writers in German, French, English, and Italian. The author concludes that boundaries based wholly on any one series of facts—physical or ethnographic or linguistic or economic or military—are unsatisfactory, and that it is essential to reach in every case a just balance among the many factors involved. How the people concerned are to be convinced that a fair balance has been reached is not suggested!

Apparently Prof. Sölch despairs of this, for he says later (pp. 45–46), "Since there are no absolute organic (perfect natural) boundaries, there are no quite satisfactory boundaries." Elsewhere (p. 48) he admits that "at certain times and under certain conditions linguistic, ethnological and even cultural limits may be suitable as state (international) boundaries in that they favour, at least for a time, external peace and undisturbed internal development." In a brief notice it is impossible to do full justice to this thoughtful summary of principles. The work is very fully documented, and the eleven pages of bibliographical notes and references at the end add much to its value. It is at once a useful contribution and a guide to the literature of frontiers. C. B. F.

Geography of the Jewish 'Book of Jubilees.'

The apocryphal 'Book of Jubilees,' known also as the 'Little Genesis,' which is an abridgment of, or commentary on, the first two books of Moses, has received the attention of various students, and an English version translated from the Ethiopic text (the only complete one extant, derived from the original Hebrew through an intermediate Greek version) was brought out by Canon R. H. Charles in 1902 (cheaper edition 1917). But few of the commentators appear to have been quite successful in their treatment of the geography of the book. A new attempt, based on an extensive knowledge of the East and a study of its ancient geography, has been made in *Petermanns Mitteilungen* (1925, 11/12 Heft) by Herr Paul Borchardt, whose elucidation of the travels of Benjamin of Tudela was noticed in the *Journal* for July last (vol. 66, p. 78). This writer starts with the view that the early geographical descriptions are as a rule extraordinarily correct, and that the contrary belief is due to the inability of the commentators to understand them. This has been suggested especially by his experiences when questioning native caravan leaders and traders about routes and peoples of the East, which have given results comparable to those recorded by the early writers. A knowledge of the great trade-routes of antiquity served as the foundation of all geographical information in those days, and an examination of the 'Book of Jubilees' on this basis shows, Herr Borchardt thinks, that its writer had wonderfully correct conceptions of the geography of the ancient world, and probably had some sort of map before him when he wrote. The division of the world between the three sons of Noah, described in chapters viii. and ix. of the work, is evidently based on the opinion of those who drew the line of division between Europe and Asia, not north from the Tanais (Don), but from west to east along the Taurus and its eastward continuation. In Mount Rafa, the river Tina, and the Sea of Me'at (by which the first part of the boundary of the Sons of Shem was defined) Herr Borchardt sees, not the Riphæan Mountains, the Tanais, and the Mæotis of other commentators, but the mountains of Arrapha (on the watershed between Mesopotamia and the Caspian), the Leontes or Lita, and the Sea of Hamath; the boundary thus following generally one of the great routes of antiquity. The other limits of Shem are also well defined by old routes: one of the fixed points, Keraso, fits in well with Gerasa near the head of the Gulf of Aqaba, and Afra, where the line crosses over to Africa, is not the name of that continent, as Canon Charles thought, but the land of the Afar or Danakil. In the subdivision of territory among the sons of Shem the name Pharnak occurs in connection with the bounds of Elam, and was identified by Charles with Pharnacia on the coast of Pontus. In accordance with his views on the general line of partition between Shem and Japhet Bornhardt connects it rather with the Parnaci of Ptolemy and the Pharnacotis of Pliny, its location being therefore at the crossing of ancient routes in the modern

Seistan. The northern bounds of Japhet follow the old land route by the Danube, Alps, and Southern France and Spain to Gadir or Gades on the sea Ma'uk (the Atlantic), in which we may have the Phœnician root *uk* (circle), already suggested by Forbinger as the origin of the Greek *Okeanos*. The same name is used to define the termination of the bounds of Ham in the far west. We cannot follow the writer in his further identifications, beyond noting that Mesech, placed by others near the Black Sea, is shifted (apparently with reason) to Spain. But it will be evident that the study is worthy of attention, and though some of the explanations are perhaps venturesome, many seem at least better founded than those of previous writers.

GENERAL

Bibliographie Geographique Annuelle, 1924.

The October number of the *Journal* contained a leaflet drawing attention to the forthcoming publication of the 'Bibliographie Géographique Annuelle' for 1924, and to the special arrangements and terms for British subscribers. This volume, to which the Society, at the request of the British National Committee for Geography, has contributed much of the British material, has now appeared, and those who took that opportunity of ordering their copies should have received them before the appearance of this note. To those who have not ordered, we would point out once more the value of this publication to all interested in geography, a value greatly increased through international co-operation in the compilation of its material. Besides our own Society, the following bodies have assisted in this work: the American Geographical Society, the Comitato Geografico Nazionale Italiano, and the Féderation des Sociétés Françaises de Sciences Naturelles. The present volume mentions all the important geographical publications, periodical and otherwise, which appeared in 1924, with short analyses in most cases, and indications of earlier sources of information. It is greatly to be hoped that further support for this valuable work will be forthcoming. The subscription price was 10*s*., post free, and orders should be addressed to the Chief Clerk at the Society's House.

OBITUARY

Colonel Sir Gerald Henry Summers, K.C.M.G.

WITH deep regret we record the death of Col. Sir Gerald Summers, Governor and Commander-in-Chief of Somaliland. Sir Gerald was born on 12 October 1885, and was educated at Bradfield College and the R.M.C. Sandhurst. He entered the Army in 1904, and after serving successively with the Royal Sussex Regiment and the 93rd Burma Infantry, he was posted to the 26th (King George's Own) Light Cavalry. In 1912 he joined the Indian contingent of the King's African Rifles in Somaliland, and the rest of his life was devoted to the service of that country.

Captain Summers first came prominently to notice in the action of Dul Madoba in August 1913. At the very commencement of that action Mr. Corfield, Commandant of the Constabulary, was killed, and Captain Summers, who had accompanied the Constabulary as Military Adviser, was himself severely wounded in three places. Nevertheless he continued the fight against overwhelming odds, and it was in a large measure due to his splendid example that, after five hours' desperate fighting, the Dervishes drew off, leaving the

small British square practically annihilated but unbroken. For his conspicuous gallantry on this occasion Captain Summers was recommended for the Distinguished Service Order; but, owing to the fact that regular troops were not engaged, this award was impossible. His services were however recognized by a brevet majority.

In that action he received bullet wounds in both thighs, and his left elbow was shattered. He never recovered the use of that arm, and it was amputated shortly before his death, which was directly attributable to the wounds he received in the Dul Madoba fight.

In June 1914 Major Summers was back again in Somaliland, this time as Staff Officer to the Troops and Intelligence Officer, and in this capacity he took a prominent part in the operations of 1914–15, and was mentioned in despatches. In January 1916 he was promoted Temporary Lieut.-Colonel, and appointed Officer Commanding Troops and Deputy Commissioner; and he quickly proved himself not only a military commander, but also an exceptionally able administrator. Of Colonel Summers' military work during the next four years suffice it to say that the small isolated force which he commanded was, throughout these years, in continual contact with the enemy, and under his inspiring leadership that contact was maintained so successfully that the Dervishes were already beaten before the operations of 1920, which resulted in their final overthrow. In addition Colonel Summers during these years frequently administered the Government in the absence of the Governor, and he handled the varied problems of that difficult period with unfailing courage, far-sightedness, and success.

In 1920 Colonel Summers commanded the ground troops in the brilliant operations which resulted in the complete collapse of the Dervish power, and the flight, and eventual death, of the Mullah. For his services he was promoted Brevet Lieut.-Colonel; and in the same year he received the C.M.G. From March to December 1921 he acted as Governor of Somaliland; and in 1922, at the age of thirty-seven, he was appointed Governor and Commander-in-Chief. He filled that high and difficult office with outstanding and unbroken success; but in May 1924 he was obliged to return to England, completely broken down in health, and after a lingering illness and two operations, borne with indomitable courage and cheerfulness, he died on 29 November 1925, having received the K.C.M.G. in that year.

Called to bear heavy responsibilities at an early age, hampered by ill health which he steadfastly refused to acknowledge, Sir Gerald Summers has left a mark which will not soon be effaced. With a love of work and a deep affection for the people he governed, he had great energy and great courage, with loyalty to his superiors and his subordinates, and stainless integrity. Had he lived he must surely have risen to high position. By his death his many friends are the poorer for a very lovable personality and the Empire for a soldier-administrator of proved capacity and exceptional promise, and his memory will long be cherished in the hearts of the people of Somaliland whose interests he served unto death.

Sir Gerald was elected to our Society in 1922, and was always keenly interested in its work. He worked hard to obtain the correct spelling of Somali place-names for the revision of maps and of new route reports. In the autumn of 1924 he submitted to the Permanent Committee on Geographical Names a Provisional List of Names in the Somaliland Protectorate, and subsequently took the utmost trouble in revising the spelling therein, but was prevented by his illness from bringing the work to completion.

Sir Gerald Summers married in 1916 Margaret Frances Troath, daughter of the late Lieut.-Colonel T. R. Swinburne, of Pontop Hall, Durham, and he leaves one son and one daughter.

H. S. P.
H. L. I.

MEETINGS: ROYAL GEOGRAPHICAL SOCIETY: SESSION 1925–1926

Second Afternoon Meeting, 14 December 1925.—Mr. D. W. Freshfield in in the Chair.

PAPER: The Alps and Wegener's Theory. Prof. Léon Collet.

Fourth Evening Meeting, 21 December 1925.—The President in the Chair.

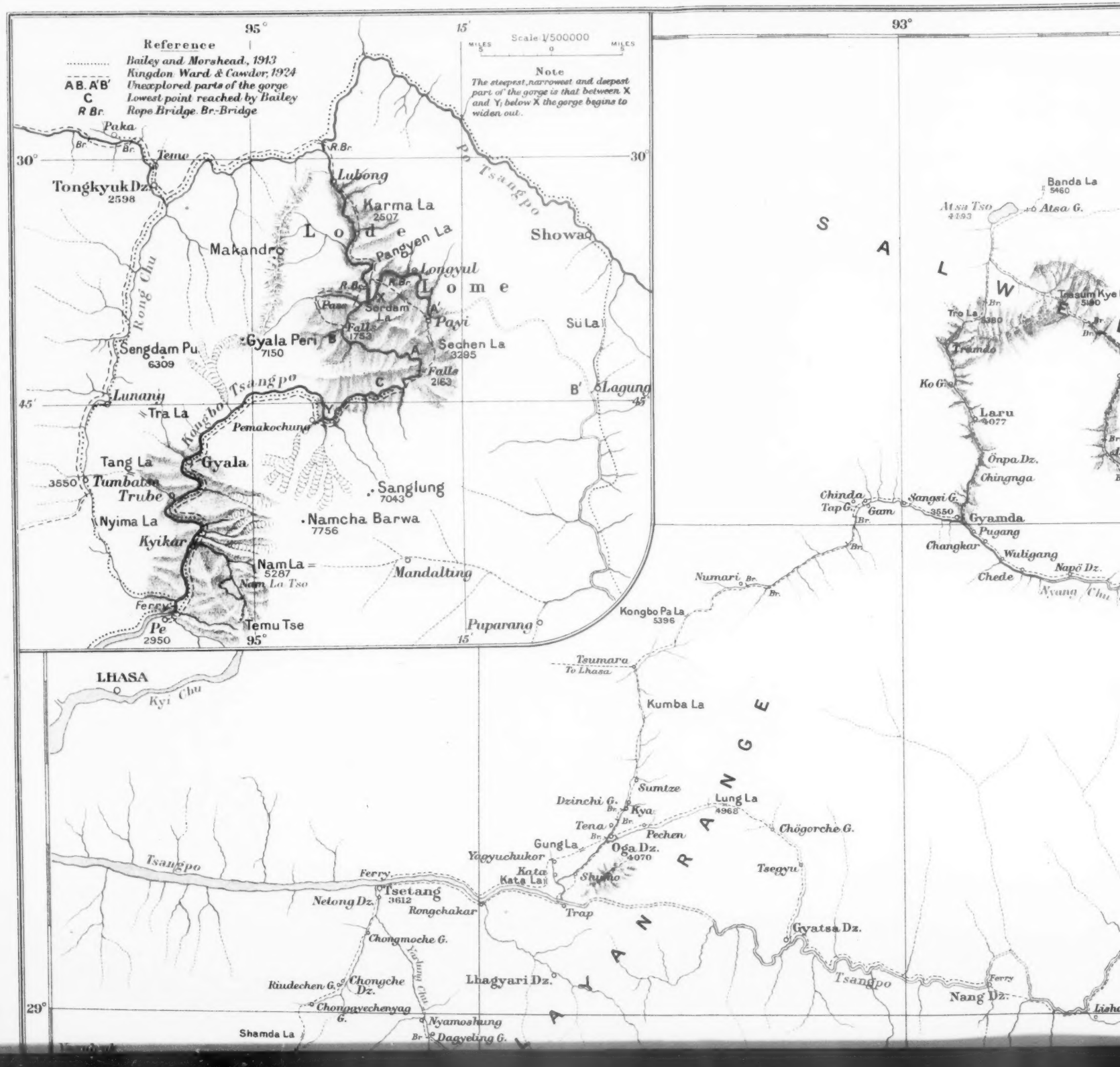
ELECTIONS.—Edwin George Ashton, M.A.; Arthur Stanley Blicq; Lt.-Col. J. G. Browne, C.M.G., D.S.O.; Raymond Leslie Callow, B.A., B.SC. (LOND.); Edward James Collins; Hugh Craggs; Lieut.-Colonel H. E. Crocker, C.M.G., D.S.O.; Major Reginald George Reynolds Davies; Charles de Bunsen; Captain William Dewhirst, R.N.R.; Mrs. D. C. Donoghue; Miss May Eardley-Wilmot; George Verdon Gare, B.A.; Captain Henry Richard Frank Wiltshire Harmer, B.A.; Samuel Rolleston Hogg, D.S.O., M.C.; Captain J. F. D. Jeffreys, I.A.; F. Ludlow, M.A.; Eugene Francis McDonald, Jnr.; Mrs. Gwendolen Mullins; William M. Pearce; Sydney Albert Spice, B.A.; Herbert Sturgess-Wells; Miss Alice Swales; Marcus Gerald Worthy; Colonel James Young, M.D., D.L.

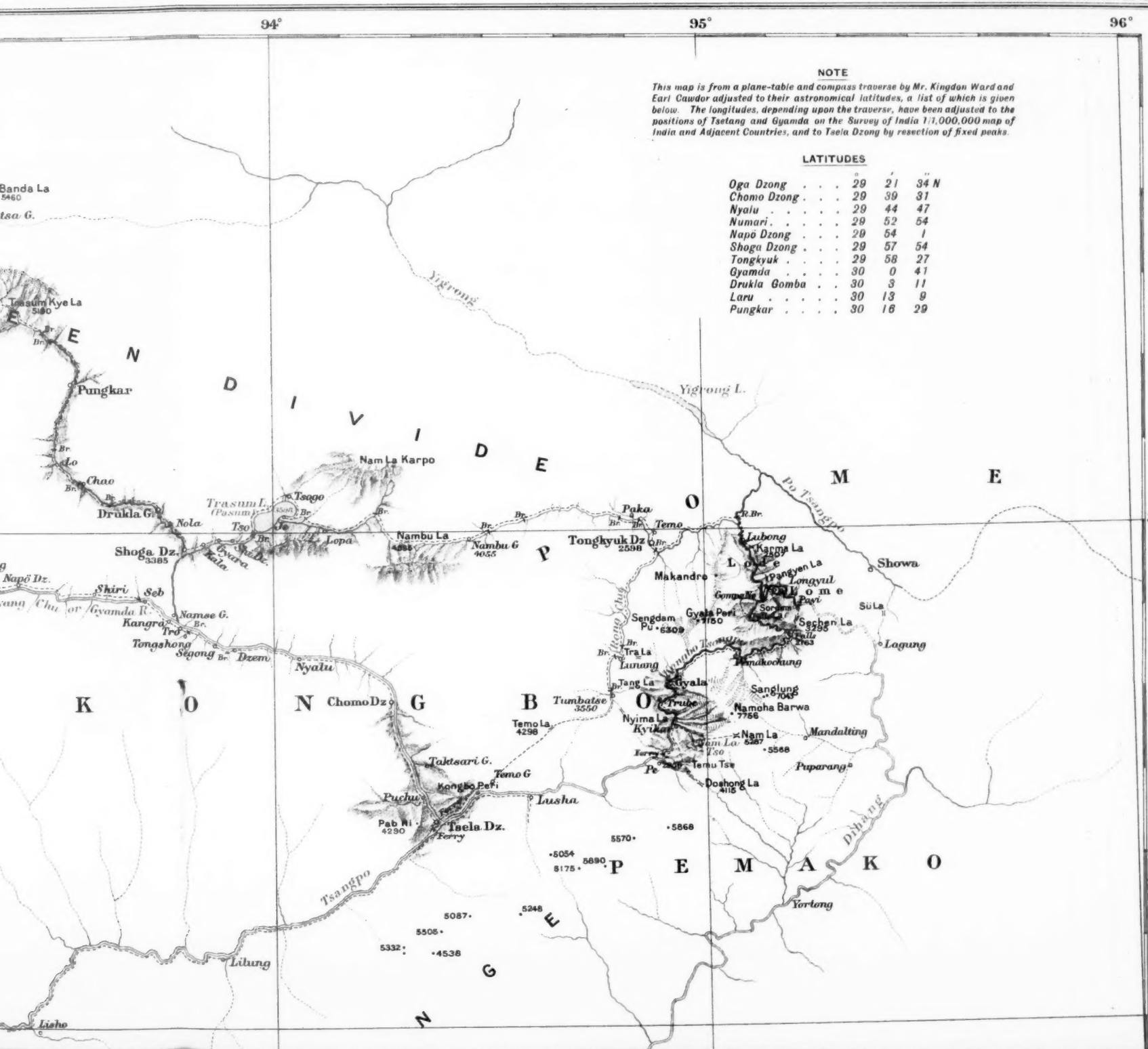
PAPER: The Inter-relations of the British Territories in East Africa. Major A. G. Church.

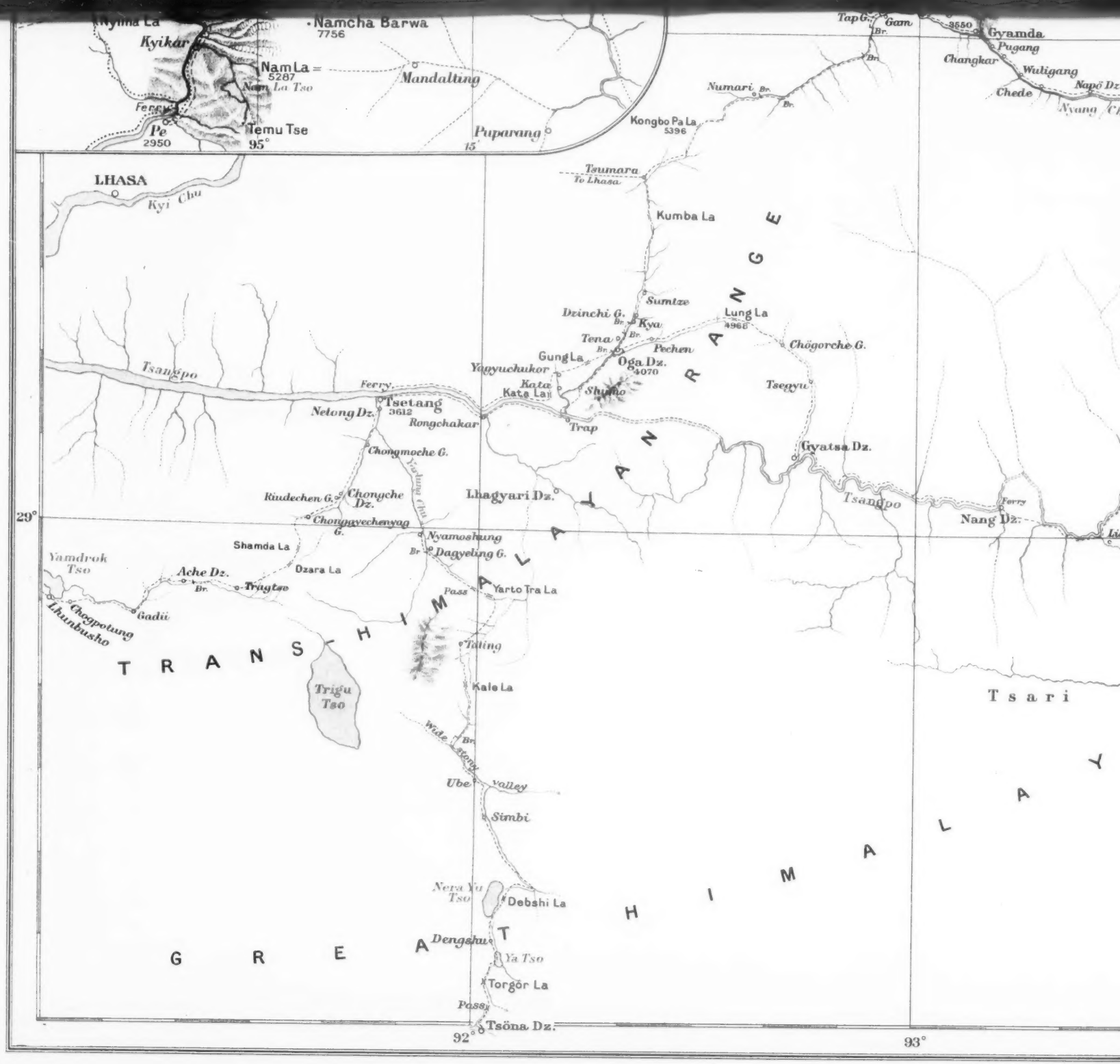
Fifth Evening Meeting, 11 January 1926.—The President in the Chair.

ELECTIONS.—C. J. Blackburne; Arnold Bradley; Miss Sarah Elizabeth Chapman; Lieut. the Rt. Hon. the Earl of Cranbrook; Captain J. Durward; Captain Charles Albert Griffiths; George Henry; Roy Murray Hyslop; Mrs. Jeyes; Keith Le Cheminant; Harri Lovell; General Sir George F. Milne; Benjamin Howell Morgan; Edward S. Price; Prof. B. C. Ratra; John Joseph Rowe; Sirdar Harbans Singh; Norman Vincent Sowden; Henry Patrick Spencer; Edmund Spurr Whitman; Albert Victor Williamson.

PAPER: The Assam-Burma Frontier. J. P. Mills.


Reference
Bailey and Morshead, 1913
Kingdon Ward & Cawdor, 1924
AB. A'B'
Unexplored parts of the gorge
C
Lowest point reached by Bailey
R Br.
Rope Bridge. Br.-Bridge
Scale 1/500000
MILES
Note
The steepest, narrowest and deepest part of the gorge is that between X and Y, below X the gorge begins to widen out.
95°
15'
93°
30°
45'
29°
Paka
Br.
Temo
R.Br.
Tongkyuk Dzo
2598
Lubong
Karma La
2507
Po Tsangpo
Showa
Makandro
Pangyen La
Longyul
Lome
Rong Chu
Pass
Serdam La
Falls
1753
Pasi
Sü La
Sengdam Pu
6309
Gyala Peri
7150
Sechen La
3295
Falls
2163
Lunang
Tra La
Kongbo Tsangpo
Pemakochung
Lagung
Tang La
3550
Tumbatse
Trube
Gyala
Sanglung
7043
Nyima La
Namcha Barwa
7756
Kyikar
Nam La
5287
Nam La Tso
Mandalting
Ferry
Pe
2950
Temu Tse
Puparang
Kongbo Pa La
5396
Numari
Br.
Tsumara
To Lhasa
LHASA
Kyi Chu
Kumba La
Sumtze
Dzinchi G.
Kya
Lung La
4968
Tena
Pechen
Chögorche G.
Gung La
Oga Dz.
4070
Yagyuchukor
Kata
Kata La
Shumo
Tsegyu
Tsangpo
Ferry
Tsetang
3612
Netong Dz.
Rongchakar
Trap
Gyatsa Dz.
Chongmoche G.
Yarlung Chu
Riudechen G.
Chongche Dz.
Lhagyari Dz.
Tsangpo
Ferry
Nang Dz.
Chongyechenyag G.
Nyamoshung
Br.
Dagyeling G.
Shamda La
HIMALAYA RANGE
SALWEEN
Banda La
5460
Atsa Tso
4193
Atsa G.
Tro La
5380
Tramdo
Ko G.
Laru
4077
Onpa Dz.
Chingnga
Chinda
Tap G.
Gam
Br.
Sangsi G.
3550
Gyamda
Pugang
Changkar
Wuligang
Napö Dz.
Chede
Nyang Chu


94°
95°
96°
30°
29°
NOTE
This map is from a plane-table and compass traverse by Mr. Kingdon Ward and Earl Cawdor adjusted to their astronomical latitudes, a list of which is given below. The longitudes, depending upon the traverse, have been adjusted to the positions of Tsetang and Gyamda on the Survey of India 1/1,000,000 map of India and Adjacent Countries, and to Tsela Dzong by resection of fixed peaks.
LATITUDES
Oga Dzong . . . 29 21 34 N
Chomo Dzong . . . 29 39 31
Nyalu 29 44 47
Numari 29 52 54
Napö Dzong . . . 29 54 1
Shoga Dzong . . . 29 57 54
Tongkyuk 29 58 27
Gyamda 30 0 41
Drukla Gomba . . 30 3 11
Laru 30 13 9
Pungkar 30 16 29
Banda La 5460
Tsasum Kye La 5180
Pungkar
Yigrong
Yigrong L.
Nam La Karpo
Trasum L. (Pasum)
Tsago
Drukla G.
Nola
Tso
Lo
Chao
Lopa
Shoga Dz. 3385
Kala
Nambu La 4985
Nambu G 4055
Paka
Temo
Tongkyuk Dz 2598
Po Tsangpo
Lubong
Karma La 5307
Pangyen La
Longyul
Makandro
Showa
Sü La
Napö Dz.
Shiri
Seb
Kangra
Namse G.
Tro
Tongshong
Segong
Dzem
Nyalu
Gyamda R.
Sengdam Pu 6309
Gyala Peri 7150
Seshan La 5295
Tra La 5763
Lagung
Lunang
Tang La
Gyala
Sanglung 7045
Tumbatse 3550
Trulse
Namcha Barwa 7756
Chomo Dz
Temo La 4298
Nyima La
Kyikar
Nam La 5287
Mandalting
Taktsari G.
Temo G
Kongbo Peri
Puchu
Lusha
Pe
Temu Tse
Doshong La 4115
Puparang
Pab Ri 4290
Tsela Dz.
Ferry
5868
5570
5054
5175
5890
Dihang
Tsangpo
Yortong
5087
5248
5508
5332
4538
Lilung
Lisho



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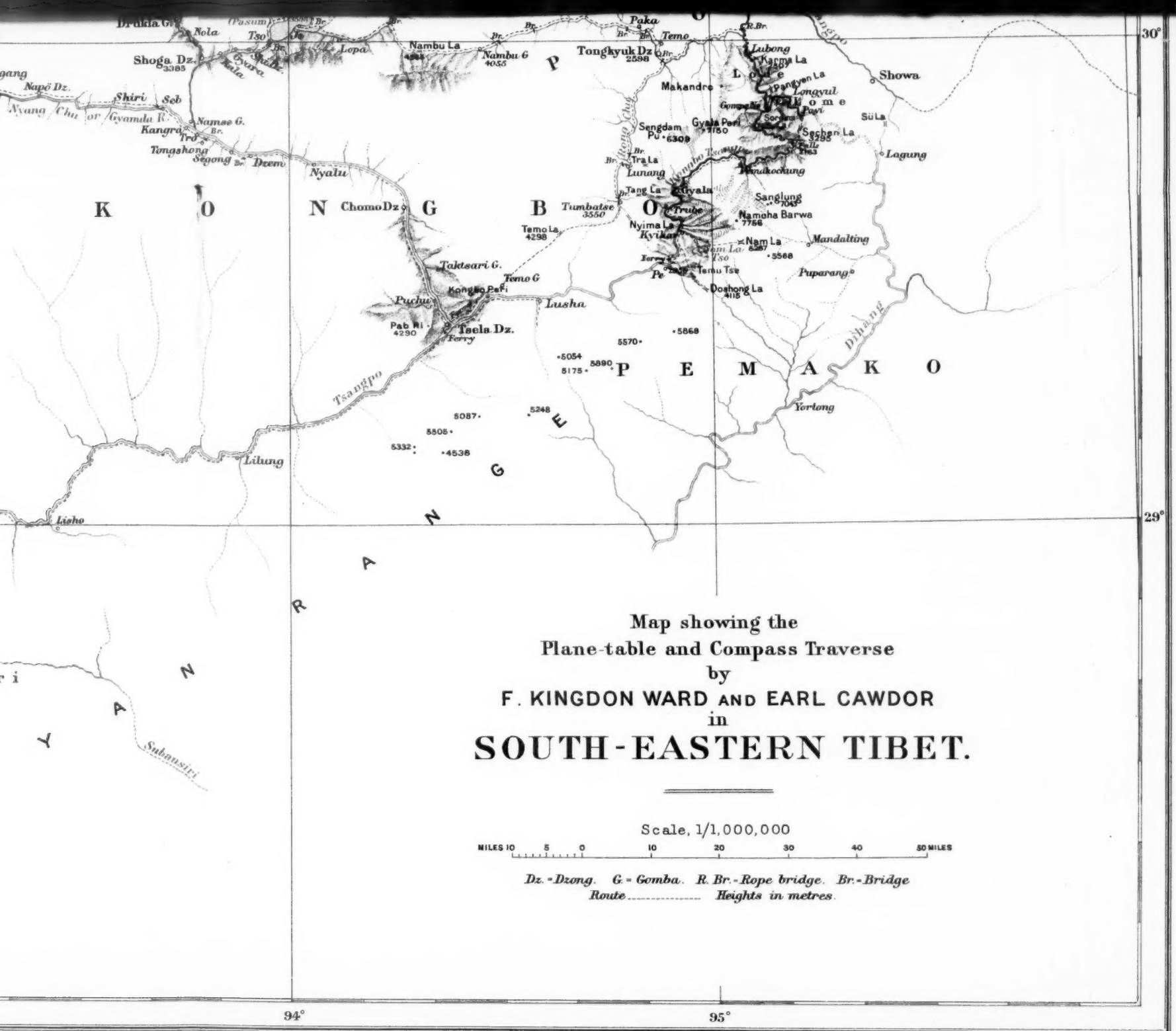


Map showing the Plane-table and Compass Traverse by F. KINGDON WARD AND EARL CAWDOR in SOUTH-EASTERN TIBET.

Scale, 1/1,000,000

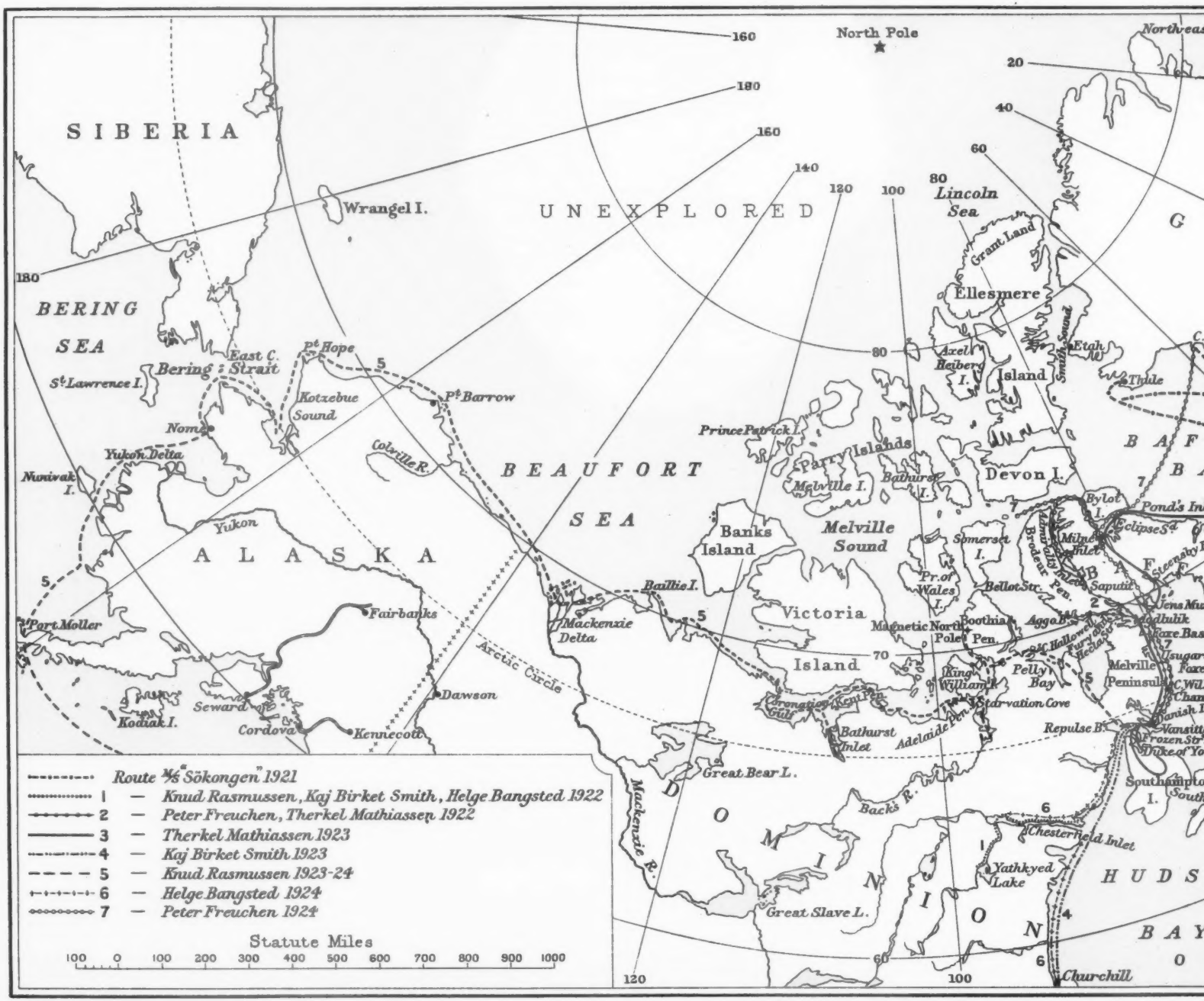
MILES 10 5 0 10 20 30 40 50 MILES

Dz. = Dzong. G. = Gomba. R. Br. = Rope bridge. Br. = Bridge
Route ..... Heights in metres.

...blished by the Royal Geographical Society.

SOUTH-EASTERN TIBET
Kingdon Ward & Cawdor

ROUTES OF DR. RASMUSSEN'S FIFTH THULE EXPE



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XPEDITION 1921–1924

FIFTH THULE EXPEDITION
Rasmussen